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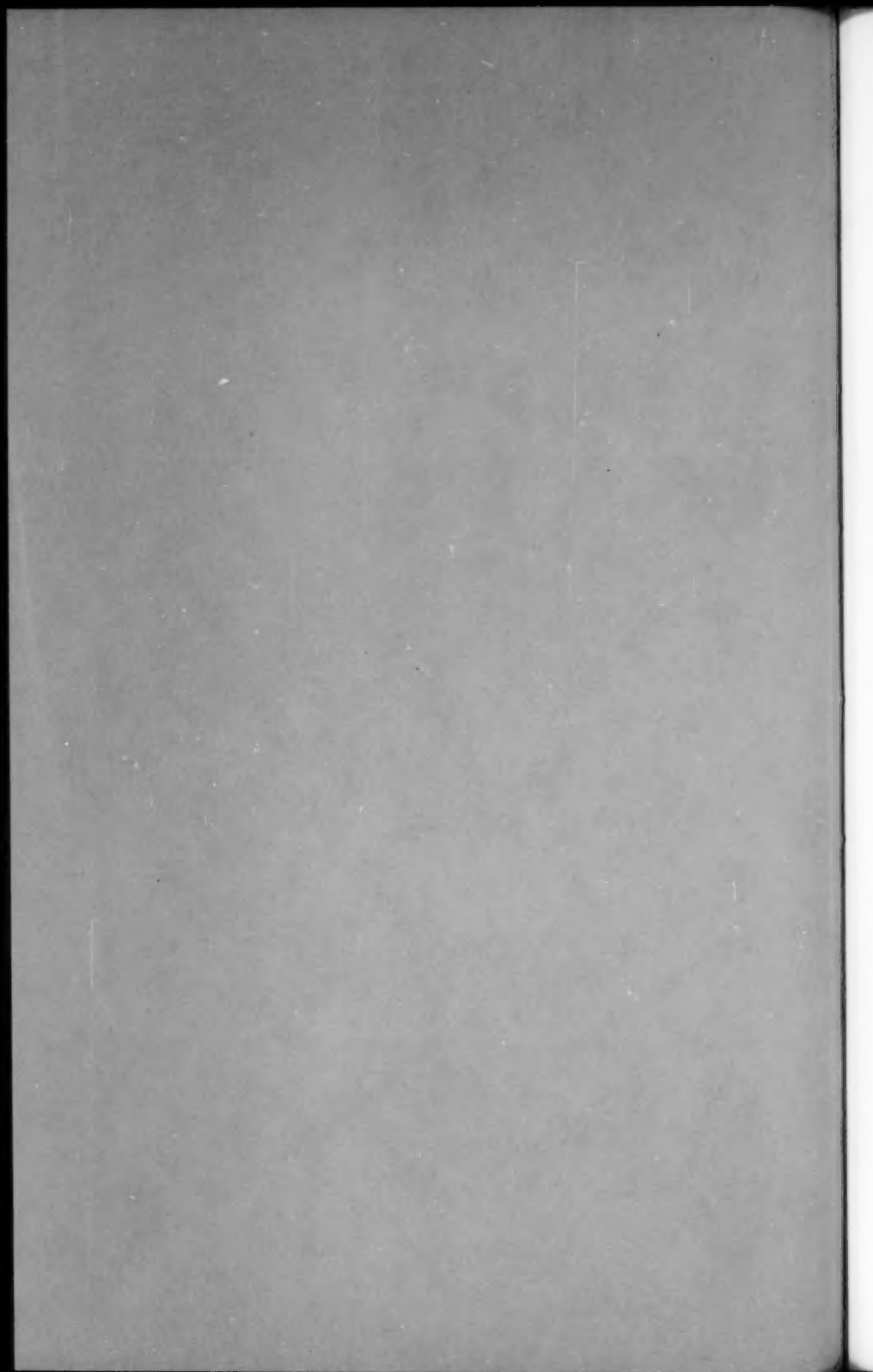
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JOURNAL  
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FRED C. ZAPFFE, Editor

July, 1949

**Clinical Clerkships for Sophomore Medical Students\***

DONALD SLAUGHTER

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Ever since I have known our beloved and stimulating secretary, Dr. Fred C. Zapffe, he has always emphasized the right of a medical school to experiment with its curriculum. As a matter of fact, he has been one of the staunch supporters, among others, who have felt that not to experiment in medical education precludes progress.

Medical education, like the practice of medicine, must always go forward, it can never stand still, and it must never go backward. In order to accomplish this purpose, each institution should have the privilege of determining its own educational destiny, and the only way that I know to bring this about is to experiment. Most of you here will recall that a year ago the late Dr. Donald T. Tresidder<sup>1</sup> expressed this viewpoint as follows:

"The time has now come to arrest the growing trend toward inflexible standardization of all of our schools, in order that each institution may capitalize on its own experience and unique opportunities. Each institution is strongly influenced, as well as limited, by its past history, its geographical location, resources and present leadership. Necessarily, therefore, it is undesirable for every school in the country to attempt to follow the same pattern of medical training. The right of a faculty to determine its own educational policy and its freedom to carry on educational experiments without interference or restraint are indispensable to the future of American medicine." Again, you may recall that John Walker Moore<sup>2</sup> told this group at the meetings in Mississippi in 1946 that "while it is generally conceded that all medical education is alike, nevertheless, there has never been established a royal road for either the teacher or the pupil getting at the basic or clinical sciences of his day."

I came to the two year school of the University of South Dakota School of Medicine, in 1946. Shortly thereafter, I was bothered considerably as to what could be done to improve our curriculum. I was particularly struck by a remark of Walshe.<sup>3</sup> He said:

"It is the fundamental defect of our teaching that we have not given the student a firm grasp of general principles; we have not taught him to weigh evidence; to discriminate or think logically, and we have too often failed to imbue him with a keen desire

\*Read at the Fifty-ninth Annual Meeting of the Association of American Medical Colleges, held at White Sulphur Springs, W. Va., November 8-10, 1948.

of understanding that is the essence of true education. We have been content to pre-occupy him with feats of memorizing and with the acquisition of an increasing number of techniques."

With the words of Walshe a constant stimulus, the Curriculum Committee of our institution decided if we were to meet the challenge of present-day medicine and to have sophomores who would be able to compete with the best juniors of other institutions when they transferred, something must be done with our present curriculum. We realized that certain departments had too many hours and, as Victor Johnson<sup>4</sup> has pointed out, "There has resulted a scramble for student time in which every hour of student time not specifically accounted for in the curriculum is counted as fair game. The department with the most aggressive hunters captures these hours. The successful department is the one which has acquired most hours into which it then crams a maximum of details whether or not it is relevant." This condition held sway in most of the first two years of medicine, unfortunately, a few years ago and still is true in certain instances.

How, then, is it possible to include the necessary clinical subjects in the first two years if the curriculum is already jammed? For some reason or other the simple statement of fact made by Davison<sup>5</sup> has been overlooked to wit: it would require more than four calendar years for undergraduate medical education unless some of the older subjects, especially anatomy in the basic science years, were reduced in order to insert, or have time for the insertion, of the necessary clinical subjects.

It was my good fortune, in 1946, to have the opportunity of recruiting an almost entire new faculty. All of them are young men who were recently familiar with the unnecessary load which had been placed on medical students in the basic sciences to the exclusion of clinical subjects. It was, therefore, relatively easy to reduce anatomy, biochemistry, bacteriology and pharmacology. We all agreed that most departments give too many lectures anyway, and if they would use more care in preparing their lectures they could give the same material in a much shorter time. We all agreed, also, that there was too much time wasted in the average laboratory. It is to be recognized that basic science courses, particularly anatomy and pathology, demand time consuming hours which are inherent in the nature of these subjects which prevents extreme curtailment of clock hours of teaching. However, courses in which the laboratory work is of an experimental nature can and should come under close scrutiny for possible improvement. To me there is nothing more horrible than to ask students to perform an experiment which does not work. Certainly the elimination of unproductive laboratory hours allows a much better presentation of the fundamentals in any given basic science course. Physiology and pathology were not materially reduced because it was felt that they were the two most important backbones necessary for the proper understanding and interpretation of clinical medicine.

It is perfectly natural to ask how sophomore medical students would have the necessary background to do clinical clerkship work. I should point out that



our students receive lectures in medicine, surgery, obstetrics and gynecology, pediatrics, physical diagnosis, radiology and psychosomatic medicine. In addition, they are given the normal and pathological work in physical diagnosis with the opportunity of working up patients, and they are assigned a few patients in medicine and surgery during the second semester as well as attending wet clinics in medicine and surgery. All in all, the clinical instruction that our students receive is equivalent in quality and quantity to more than a few curricula given to junior medical students a decade ago.

However, a year ago this fall, the Curriculum Committee and myself felt that something was lacking. I suggested, with some considerable trepidation, that it might be worth while to send each of our sophomore students out with a man in general practice for the month of May. After considerable discussion, the faculty agreed to rearrange the curriculum last year so that this might be accomplished.

Actually, our plan for the sophomores was to determine, if possible, whether or not we might inculcate them with the desire to do a good job of general practice rather than to specialize, because the type of doctor that we need to return to South Dakota is one who does general practice. As a matter of fact, should not most medical schools bend every effort to graduate doctors prepared for the general practice of medicine? It seems to me that the plan which I am reporting could be used with success in all medical schools. It offers a means of including in the medical curriculum a course or line of study which may be expected to materially contribute in total numbers of general practitioners. In this connection you may recall that Lester J. Evans<sup>8</sup> a few years ago said, "However the practice of medicine may be organized in the future, I believe the simplest road to comprehensive medicine is to train expert general physicians to do an essential job not covered by the present specialties." We will always need specialists, and they are indeed a very important part of the make-up of the practice of medicine, but in sparsely settled states such as ours we feel that we must bend every effort to bring into our state doctors who are chiefly interested in a good general practice of medicine.

So far as I know, this plan of clinical clerkships, which really is a combination of the preceptor-tutor-clinical clerk method of teaching, has not been attempted at the second year level. Perhaps, it is for this reason and because the plan may be startling to many of you that I have taken the time to present a background leading up to the main theme of my remarks.

In order that we could do the best possible job, the preceptor or tutor under whom each student worked was selected with the greatest of care and only after consultation with those who knew the individual doctor best. It was gratifying, indeed, that not a single physician who was chosen as a clinical associate for this work hinted a refusal to cooperate. We felt that we had gotten safely over the first hurdle, because I was somewhat skeptical as to the reaction that might follow such a proposal.

The assignment of the students was made more or less at random, except

that no student was to be under the wing of a physician in his home town. This obviated any embarrassment either on the part of the patient, the physician or the student. Shortly before the students left for their month of clinical training, I met with them and we discussed certain rules of conduct. The code of medical ethics was emphasized; the fact that the patient is the physician's patient and not the student's was likewise made clear. Finally, it was pointed out that the discussion of the case with the patient should be in the presence of, and with the approval of, the physician, and that in no case should the student make an adverse comment on the handling of the case to the patient.

Each student was given a daily log book in which he kept a brief account of his daily activities, listing all of the patient contacts at the hospital, the office, or the home and recording a brief summary of the histories, physicals and laboratory examinations as well as the treatment and result of same. He also was asked to list the number of hours on duty, showing the time spent with the physician and the time spent independently on collateral reading. This data was then summarized in a weekly report and sent to the dean's office.

I believe it is of interest to read you a report of a log day taken at random:

- 7:00 A. M. Breakfast.
- 8:00 A. M. Rounds with the doctor in the hospital.
- 9:30 A. M. Normal delivery. Ether anesthesia, no episiotomy.
- 9:45 A. M. Mrs. Blank operated—ovarian cyst. Part of each ovary excised. Retrocaecal appendix removed.
- 11:30 A. M. Head injury—little girl kicked by cow. Deep gash in occipital region—stitches taken.
- 11:45 A. M. Hand injury—multiple shallow gashes, both hands. Apparently intoxicated.
- 11:55 A. M. Pneumothorax—old the patient.
- 12:10 P. M. Dressing applied to Mr. Blank's boil—drain removed.
- 1:45 P. M. Treated venereal warts. Patient also had a venereal itch.
- 2:00 P. M. Senile pruritis—used ultraviolet light.
- 2:05 P. M. Did history and physical on patient with cardiac asthma.
- 3:45 P. M. Several surgical dressings removed.
- 4:30 P. M. Saw patient with hypertension who is very obese.
- 5:00 P. M. Baby came in badly burned on both hands. Blisters opened with scissors and dressed with Foille.
- 5:30 P. M. Saw case Von Recklinghausen's.
- 6:30 P. M. Supper.
- 7:30 P. M. Rounds with doctor at hospital.
- 9:00 P. M. Reading in hospital library.
- 2:10 A. M. Watched patient die and helped undertaker "lay out" body.

The physician in charge of each student was informed of the necessity of seeing to it that the work of the student as outlined was properly carried out. In addition, it was suggested to the preceptor that the student should gain experience in the practice of medicine through the hospital, office and home calls. Special emphasis was placed on history taking, physical examinations, laboratory examinations, prescription writing and various commonly used techniques such as catheterization and the like. Finally, each physician was advised to do all in his power to indoctrinate the student with the art of medicine, especially as it relates to general practice.

In order to double check the work of the student, a simple weekly report was sent in by the physician showing the hours on duty, but more especially indicating the cooperation, ability, general interest, application and punctuality of each clinical clerk.

In order to further evaluate the plan, two faculty members and myself visited each physician and his student. We naturally expected that the students would enjoy their month of clinical training, but we were still somewhat dubious as to the response of the physician. However, there was not a single unfavorable reaction from a single preceptor and since people in this part of the country are very much outspoken, I know that if they really were dissatisfied they would have said so. Typical comments are as follows: "This is indeed a very fine plan—I wish that I had had similar training when I was a sophomore medical student." Or: "The opportunity to have spent a month with a man in general practice when I was in medical school would have benefited me and made me a better junior student." Or: "Having the student with me has made it necessary that I read my journals a little more carefully." And so it went. And I shall not take the time to report any more of the impressions that I received from the physicians.

We returned home from this trip of interviews just shortly before the month of the clinical clerkship was ended. It was indeed a gratifying experience, and at our faculty meeting a day or two after, I was able to report with full confidence that our plan of experimentation had been a success.

Statistics may be boring, but I should like to report a few of the data of this experiment. There were 25 second year students in last year's class. They saw 6,799 patients. They spent 3,765 hours with the physician and they were on duty 4,869 hours. This means that each one of them got in at least 40 hours of collateral reading and study while they were seeing and observing the general practice of medicine. These 25 students saw 161 deliveries, 3,615 medical cases and 629 operations. They performed 510 complete physical examinations and ran 1,915 laboratory tests. Finally, under the clinical associate's supervision, each one of them wrote an average of 24 prescriptions during their month of clinical clerkship.

The immediate reaction to the large number of cases observed, to most of you, I am sure, is that the student did not have time to learn anything about any of them. We had calculated that such might be the case. In order to offset quantity against quality, the student was required to report a case to his clinical associate each week. This case report had to be complete, not only including the proper physical and history findings, but reason had to be given for the diagnostic impression. This could only be done, of course, by the proper collateral reading and a thorough discussion with the clinical associate. Copies of these case reports were sent in to the dean's office each week and I can assure you that many of them would put the case reports of junior and senior medical students to shame.

Two weeks after completion of the clinical clerkship, I sent the following

questionnaire to those students who had participated in the plan. All 25 of them expressed the opinion that they enjoyed and profited from the month's experience. Twenty-three of the 25 stated that the physician cooperated to the fullest extent. Most of the students preferred medical and surgical cases and only a few showed a preference for obstetrics and pediatrics. In answer to the question, "Would you prefer another month of didactic work to the clinical clerkship?" they all answered "no." Twelve thought the time element was too short, one thought it was too long, and twelve thought it was adequate. Nine of the 25 were asked by the physician under whom they worked to stay on for a longer period of time and six of the students actually did accept this opportunity.

In order to check on our shortcomings, we asked the students in which subjects they felt they were deficient. Three each stated that physiology, physical diagnosis and biochemistry were not stressed enough. Two each believed that they needed more anatomy and pharmacology, while one felt a lack of pathology. If the experiment did nothing else, it certainly gave us the opportunity to correct the teaching of the fundamental sciences because it has been my observation that most medical students give fair and impartial answers under such circumstances.

It has been a privilege to relate to you the results of our experiments in medical education. We believe that a clinical clerkship for the second year students is a definite step forward. In fact, we believe that it can easily be the preferential plan of attack to interest students in the general practice of medicine. In most institutions the specialistic philosophy is emphasized in the third and fourth years. Hence, it might be wise indeed to give the student a chance to view general practice at the second year level in order that he will consider this type of practice of medicine more favorably.

In discussing this matter with each of the students, I found a great number of them who had no desire prior to their clerkship experience of practicing in South Dakota, but now many intend to return and do a good job of general practice. I feel that it is my responsibility to do everything possible to interest and stimulate our students to want to do general practice. I believe that the majority of those who indicated that they would come back will return, even though they finish their last two years of education at some four year school. I say this because they saw at first hand the art and the practice of medicine in small communities as carried out by well trained physicians. These things they will not forget and in not forgetting they will make the results of our experiment statistically significant.

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## DISCUSSION

DR. CHAUNCEY D. LEAKE (University of Texas): This splendid program as outlined by Dr. Slaughter raises a serious question, it seems to me, as to whether or not our formal didactic course or curriculum in medicine isn't too long. Maybe we can cut it down to advantage. Three points of importance are emphasized by Dr. Slaughter. One is the increasing significance of stressing general principles in the basic sciences. This is almost a forgotten art on the part of the teacher. Only too rarely do our textbooks give consideration to the general principles of the subjects that they cover, and unfortunately, our teachers follow the textbooks too closely.

The second point concerns the importance of careful selection of preceptors. Our long experience at Wisconsin, at California, and in Texas during the war years, certainly emphasizes the necessity of great care in the selection of preceptors who are wise in the ways of medicine.

The third point is the importance of briefing thoroughly both the student and the preceptor, in the conduct of the effort and in the consideration of what may be achieved by them. I believe that the preceptorial clinical clerkship, as outlined by Dr. Slaughter, is deserving of careful consideration.

DR. DONALD SLAUGHTER (Closing): Thank you very much, Dr. Leake. Speaking of preceptors, I think it might be interesting to relate that at our state meeting last June I was jumped all over by several doctors in the state who didn't get a student. In fact, it went to the point where they thought the state medical association ought to do the assigning. One of the finest accomplishments which resulted from our plan of clinical clerkships was the good effect on public relations between the physicians and citizenry and the medical school.

## Intern-Resident Training in a Private General Hospital

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Grace Hospital of Detroit, Michigan, is a private general hospital with a normal intern-resident staff of 72 men, one-half interns, and the other half residents in medicine, general surgery, neurosurgery, obstetrics and gynecology, ophthalmology and otolaryngology and urology.

Previous to October 1, 1947, the training of the house staff was under the direction of the administrator of the hospital, working with committees appointed by the Executive Committee. Under the impetus of the Specialty Boards and the American College of Surgeons, an attempt was made to bring the Training Program above the level of an out and out preceptorship by supplementing the hospital conferences and lectures with capsule courses in the so-called basic sciences at Wayne University. With the stretching of available clinical material to fit the expanded numbers brought about by the returning G. I.'s seeking specialty training, it became increasingly apparent to the staff that something should be done to correct the poorly coordinated and loosely supervised Training Program. Dr. K. B. Babcock, director of the Grace Hospital, discussed the staff's worries with the Board of Trustees and, as a result, a private grant was made by one of the trustees creating the position of director of education, effective October 1, 1947.

Having come into this position from 25 years of private practice of medicine, I felt it was necessary to take time to become oriented and gather impressions as to the educational problems peculiar to our hospital before setting up a Training Program.

A survey of the teaching capacity of our visiting staff revealed a fair amount of talent to carry out a sound program. It was found in addition that the men were more than willing to take time away from busy practices provided sufficient time was allowed them to prepare subjects and to arrange time away from the routine duties of practice. All had had previous teaching experience. Some had served as instructors in basic and clinical subjects during their medical school affiliation, some during their residency period and several were or had been on the part-time faculty of a medical school. Several had published results of basic and clinical investigations and the group had maintained its interest in the advance of science. All were sound practitioners of medicine and in good standing locally and nationally. Part were Board licentiates through founders membership, part by examination and the remainder had the training and qualifications to become board members when they chose to try the examinations.

\*Read at the Fifty-ninth Annual Meeting of the Association of American Medical Colleges, held at White Sulphur Springs, W. Va., November 8-10, 1948.

It was quite apparent that we were training our residents too vertically. There was too much emphasis on the minutiae and trivia of the specialty with neglect of the concept that the human being is a complex interdependent organism. It was felt that to educate a good specialist we had to start with a good physician—that we had to build a foundation horizontally and then build vertically. Pictorially the concept might be illustrated by a triangle the apex of which has been pulled to a fine point—the triangle representing the training in general medicine and the extended apex the training in the specialty.

In the rush to train residents, the Intern Program did not keep pace. The intern was assigned to a ward or corridor mainly on the basis of a clinical clerkship to keep the records up to date and acceptable in form and appearance. The opportunity to observe or manage a case from admission to discharge was not great nor did he have many opportunities to check his diagnostic skill—or lack of it—by assisting at surgery on a case he had studied. Often the history and physical were done after surgery had been completed and all too frequently the intern assisted at surgery on a patient he not only had not had the chance to study—but had never seen before and would not again see. It was apparent that the emergence of the intern from the medical chore boy status had not yet been wholly accomplished. There are still some staff members in private hospitals who feel the intern is there to do the bidding of the visiting doctor, look after records and do the routine technical procedure of diagnosis and therapy. This attitude contributed to the development of mutual disrespect and a hypercritical approach toward each other. It was obvious that those of the visiting staff "who carried that concept" (and they are a small minority) had to change their attitude. It was suggested to them that they look upon the hospital as a graduate school and recognize that although the intern year was compulsory the young men were earnest and eager to prepare themselves for the practice of good medicine and that it is the traditional responsibility of every physician to teach.

As was to be expected, this same small minority that tends to treat the house staff like medical acolytes offered resistance to improving the Training Program. Their cry was that there are already too many specialists, or that training is too academic or highfalutin or that it was adding unnecessary cost to the care of the patient. As a compromise they preferred the old assistantship method. In their opinion the setting up of standards by the A. M. A. and the College of Surgeons is an abrogation of the Bill of Rights and constitutes interference in the lives of free men.

With the coming of the various Specialty Boards and their requirements that a candidate for examination be adequately trained in the basic sciences the medical schools were asked to set up courses open to residents training in special fields. Many reasons were cited for the need for such courses over and above the threat of failure if qualifications for Board examinations were submitted without such academic embellishments. Somehow the whole set up seemed a bit farcical. It seemed paradoxical that residents should have to go back to



school either to relearn what they had already been taught—or could review by restudying—or have to go back to medical school because members of his hospital staff were either incapable or not qualified to teach the so-called basic sciences. If the latter is valid, a hospital with such a staff should not be certified to train specialists for obviously the resident returns to be taught by the very men declared incompetent or unqualified.

Two types of basic science courses were available: One where the resident goes back to school full time for a variable period—anywhere from 4 months to a year. The other gave courses piecemeal in the afternoon until a certain indefinite exposure has been accomplished. Grace Hospital used the latter method and as a result traffic between the hospital and the medical school each afternoon took on a rush hour character. More important, it successfully cleared the hospital of residents every afternoon and time for application of what was being taught at school diminished to well nigh the vanishing point. Furthermore the experience did not seem to stimulate the individual resident to greater curiosity or interest in basic medicine as has been claimed. He seemed to be content that he had a credit for a course that his Board would he hoped be very pleased to see some day.

After a 5 months' period of observation, I visited several of the Eastern and mid-western medical schools and teaching hospitals to confer with deans and hospital educators. Some of the conclusions I had come to were proven incorrect—some were accepted practice—encouragement was given in most instances; and without exception there was interest in the idea of a private hospital appointing a full time director to look after the training of its house staff. On July 1 of this year, the New Program went into effect at Grace Hospital.

Patients at Grace Hospital are not housed according to departments, except for obstetrics and pediatrics. Increased per capita cost of departmentalizing prohibits its consideration in these times of high hospital costs. Yet, some form of segregation is essential to good teaching. Segregation was accomplished by geographically dividing the hospital into 6 divisions and thinking of them as 6 separate interdependent hospitals. Eight men are assigned to each division—4 interns and 4 residents. One of the residents, usually a senior, is appointed the Division Head for a 6 months' period and is held responsible for the affairs of the entire unit—2 interns are assigned to surgery—2 to medicine. Interns remain in each division for a two months' period and progress forward every 2 months. Residents remain in each division for 6 months. Thus, every intern will come in contact with every resident, and every resident shall have passed through every division on completion of his stay. Under this system it works out that interns and their respective residents do have a well segregated group of patients in close proximity and in large enough numbers. The number of patients that the surgical intern follows from admission to the operating room through the post operative care has increased from 10% to 60%.

The Division Head Resident is free to set up his own administrative methods within his division and there are no set house staff rules as such. He is re-

sponsible not only for the supervision of the care of the patients, the records, the coding of charts, the teaching that is carried on, assignment of reading and the grading of the intern's work but also for the time off and the on-call assignments and surgical boardings. In a typical good division, daily rounds are made by the medical and surgical residents with their interns on all their patients. Some of the divisions have a daily conference, about problem cases, attended by all the members of the division, plus the chief resident—or a visiting staff man—or myself. The presentation of the case and preliminary discussion is by the house staff.

In each major department, i. e., medicine, surgery and obstetrics and gynecology the outstanding senior resident is designated as the chief resident of his department. In addition to routine training duties, he acts as the correlator for his department, looks after the teaching schedules for the interns and junior residents and conducts rounds with the visiting staff. The chief surgical resident, with the help of the chief resident in obstetrics and gynecology, looks after the operating room boardings and the assignment of residents and interns to surgery and surgical services. Much of the new schedules are worked up by these three men.

This year weekly department programs have continued throughout the summer in all departments. The character of the topics and their method of presentation has been quite markedly changed, particularly in medicine and surgery. The seminar type has replaced the old lecture form. The residents present the material for discussion from notes they have prepared from reading assigned by the visiting staff man who is the discussant. Topics are approached from the viewpoint of the relationship of physiology, pathology and pharmacology therapeutics to the symptomatology and treatment of the disease. As an example: On consecutive Fridays, the Surgical Section discussed the Pharmacology of Pre-anesthetic Drugs—The Pharmacology of Inhalant Anesthetics—The Pharmacology of Local Anesthetics—The discussants included the chief anesthetist, surgeons and internists. The outline of the essayist resident has proven so valuable, in many instances, that we have been asked to duplicate copies for the other residents and interns.

The capsule basic science courses have been supplanted by seminars held three days each week and conducted by selected staff men. In these informal sessions the present concepts of physiology, biochemistry, pharmacology are discussed usually in the light of a patient then in the hospital. Seminars in x-ray, electrocardiography, psychosomatic medicine, medical economics, physical medicine, etc., are conducted in similar manner. The C. P. C. and pathological seminars meet weekly, the latter conducted by the pathologist. In all of these efforts we have tried to avoid spoonfeeding the interns and residents.

The outpatient division is a very vital part of the Teaching Program. Previously the resident was assigned a period of six consecutive months in which he conducted his specialty clinic. Now the resident is assigned his clinic day

which he attends throughout his entire residency stay under the concept that it will give the young physician an opportunity to observe the progress of disease and allow him to tussle with the problems he will run into in the actual practice of medicine. The resident attends his own clinic day in street clothes and conducts himself just as he would in actual practice. Here he learns the method of referring patients and must learn how to live with his patients and his confreres. Dr. Ferguson of the American College of Surgeons commented on it as "play acting." I think of it as a dress rehearsal for the practice of medicine. Out of the outpatient department the general surgical and specialty surgical residents draw their operative patients during the last half of their training period.

The outpatient department provides opportunity for our young qualified staff men to carry on clinical investigative work and for the establishment of specialty clinics such as diabetes, cardiology, endocrinology and pulmonary disease. In the three major divisions the additional function of the young staff man is to back up the resident in his work. Supervision of the resident is purposely quite loose. If he requires help of his contemporary young staff man, he requests it, otherwise he carries on as he thinks best. Patients from the O.P.D. requiring hospitalization are admitted under the name of the resident plus his contemporary staff man. Upon admission to the hospital the patient is then presented to a selected mature visiting staff man and the department interns and residents—in this way, rather good rounds have resulted.

In addition to his established day in the O.P.D. the resident rotates through various specialty clinics. For example, the gynecology residents spend a certain amount of time in hematology, urology, cardiology, diabetes and psychosomatic medicine clinics. Each of these clinics are conducted twice a week so no conflict with his own clinic day occurs.

Surgery is done by the resident in the last half of his training period under the supervision of qualified surgeons, so all surgery originating in the O.P.D. is channelled to the senior residents, thus providing ample operative experience.

There is not a great deal of difference in the teaching approach to the intern as compared to the resident, except in the amount of responsibility given. The present day intern comes to the hospital well prepared in the fundamentals of medicine. He has become habituated to listening to the mass of facts poured at him without too much opportunity to exercise his thought processes in the application of those facts. Therefore, he makes the first professional contact with the patient on admission to the hospital. He works up the diagnosis, suggests the diagnostic procedure and the therapy alone and then demonstrates his case to his department resident who has worked up the case independently. The two in turn consult with the visiting staff man. By means of an ingenious assignment method devised by one of the division head residents, the intern is usually able to follow his patient from admission to discharge. The intern is assigned to the outpatient department two days a week throughout his entire year.

He rotates through the major departments and the specialty clinics in much the same way as do the residents.

As the intern gains confidence and experience more responsibility is given him and he becomes an active participant in an increasing number of programs. Thus if he is selected for residency he does not again have to make another adjustment or if he goes out into the practice of medicine he has had a chance to test his independence.

Under the method instituted this past July 1, the interns and residents have been given a great deal more responsibility than ever before at Grace Hospital and they have responded by discharging their obligations very efficiently and enthusiastically. Attendance at seminars, conferences, journal clubs and department meetings though voluntary have been averaging about 85%. The librarian has estimated that use of the library has increased about threefold. The visiting staff has manifested a greater interest in teaching and certainly there has been a more mature relationship between the two groups with mutual criticism at a minimum and resistance to the Training Program is disappearing.

The residents have taken hold of their teaching duties with a fine earnestness and certain it is that the interest in basic medicine at Grace has been greatly stimulated.

The outpatient department has steadily increased in both the quantity and quality of patients in the general and specialty clinics, with an increase in the amount of surgery for the senior surgical residents.

Investigative work, limited to clinical problems to date, is going on in all departments.

On the negative side, the greatest problem to be solved is the continuity of teaching. There is an advantage in one instructor having control over the fluidity of instruction and the presentation of information in systematized form. At times there is a disadvantage to the presentation of information by multiple visiting men—some poorly prepared—some unable to systematize their information.

Another problem is the development of a greater number of good teachers. The visiting staff now carrying the teaching are very cooperative and willing but they do sacrifice quite a bit of time from an already overcrowded day. The solution of both the continuity of teaching and the relieving of the good visiting staff man of too many teaching duties may be accomplished by the use of some of the full time medical school faculty on a part time basis at the hospital, the stipend to be paid by the hospital. Thus several benefits might accrue. The medical school could hold promising young men that leave on account of salary differences by offering additional stipend—the medical school and private hospital would be drawn close together and certainly the Teaching Program at the hospital would be improved and kept up-to-date.

It has been said that the private hospital is not a proper place to educate young physicians because there are not enough charity beds where the intern and resident may have the freedom of the patient to carry through with the intricacies of diagnosis and management without interference, and because most private hospitals are not departmentalized into free wards. The facts are that departmentalization can be accomplished in other than architectural ways and that teaching on private patients is just as available and effective as on charity patients, particularly so if one assumes patients are the same human beings regardless of financial status. The private hospital's contribution is probably single, viz.: The training of physicians for the practice of medicine while the function of the medical school hospital is dual—to train teachers in addition to practitioners. If the functional field of the private hospital is kept clearly in mind, there seems to be no good reason for not encouraging it to assume its share of the load in medical education.

#### DISCUSSION

DR. J. A. CURRAN (Long Island College of Medicine): I would like to congratulate Dr. Weiser on his excellent paper and the presentation of his most interesting development in the field of intern-resident education. It seems to me this presentation illustrates a very encouraging trend which we are observing, namely, the growing recognition, not only by medical schools, but by the hospitals, of the fact that the internship and the residency has become, in reality the other half of the formal education of the doctor, and the principles which apply to the education of the undergraduate medical student apply with equal force to the internship and residency.

I have had the good fortune to consult with the author of this paper in regard to his plans during the past year, and I was very much impressed with the thoroughness with which he was preparing to implement this program.

I might mention, briefly, in this connection, other attempts being made in other parts of the country to carry out similar programs. In New York City, about three years ago, aided by a grant from the Commonwealth Fund, the New York Committee on the Study of Hospital Internships and Residencies instituted a program in two of the hospitals using men who had completed their residencies in medicine and surgery on a half time basis, to act as directors of intern-resident education, spending three half-days a week in the hospital working with the house staff, helping to plan educational programs with the attending staff, and the superintendent, and in doing bedside teaching. The other two days were spent at university hospitals, participating in the educational activities there. We hoped this plan would result in a new type of teaching affiliation, and our experience with it so far has been very favorable. We intend to extend this program to a number of hospitals which have not previously had this type of leadership nor opportunity to work in affiliation with the medical schools.

Another example is the program under the Bingham Associates of Maine and Massachusetts, whereby men who have completed residency training are sent out to key hospitals in Maine and Massachusetts to serve on a full time basis for a year under a subsidy from the Bingham Associates Fund, to carry on a similar function.

A third one is the new program which has been inaugurated within the last year in five of the Army general hospitals with a director of intern education on a full time basis assigned in each instance. Affiliations have been obtained with the medical schools in the neighborhood of these hospitals, and faculty members accepting positions as attending consultants spend six hours each day they are on duty, working with the full time staff.

That arrangement, together with sound planning, explains the remarkable educational advances made by the Army hospitals during the past year or two. Civilian hospitals might study the Army program with benefit, as certain of the principles being evolved could be applied to civilian, as well as military institutions.

In general, my reactions to reports submitted at this meeting are ones of great encouragement in the advances I can see ahead along the lines described by Dr. Weiser in his paper this morning.

DR. CHAUNCEY D. LEAKE (University of Texas): It would seem that much of the success of the program as outlined by Dr. Weiser with respect to self-discipline and self-instruction is exemplified by the seminar service and the mode of study he has described. If there is a clear appreciation of objectives, then it would seem that it is possible to rely on a certain degree of self-discipline to carry through the responsibilities that are involved.

DR. FRANK A. WEISER (Closing): I have tried to approach this problem with recognition of the problems as they presented themselves at my hospital. First, we are dealing with doctors in private practice. Second, often the reputation of the private practitioner is based not on what he knows but on his commercial success, and he, for the latter reason, becomes a forceful factor in the hospital. He may not care to or be able to teach and to lighten the load on those men who are qualified to teach and willing to do so, I think one of the urgent needs is to bring the university groups into closer touch with the private hospitals, on a clinical level.

We are trying to accomplish this at Grace. We are utilizing one of the instructors at Wayne as the residents' teacher of electrocardiography. Thus, he is able to implement his school salary and we are able to provide competent teaching in a highly specialized field.

I would like this Association to become interested in the problems of the private hospital. It would be well worth it.

## Teaching Statistical Methods in Medicine\*

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A question which is frequently asked of a teacher of medical statistics is, "What is the object of teaching statistical methods to medical students?" The reply usually falls on prejudiced ears. There are those who are prejudiced in favor of biostatistics, and those who are prejudiced against it. The latter probably include nearly 100 per cent of the students entering medical school, and no small number of medical men who have been in successful practice for many years, and who can not see any reason for burdening the student with this new and complex subject. For the benefit of such persons, the medical statistician must take especial pains to persuade the research worker that statisticians are not always contradicting clinicians, and that statisticians do not always know more than the medical man. (One might wish that this belief were more universally held by statisticians!)

Those prejudiced in favor of biostatistics, as a subject in the medical curriculum, have become so for a variety of reasons:

(1) They have found need for the ability to calculate rates, percentages, weighted averages, etc.

(2) They have found it useful to be able to set up tables and draw graphs which are clear, complete and not too complex to be understood by persons who are not mathematically minded.

(3) They have recognized the importance of being able to select comparable study and control groups, to judge the extent of comparability in dissimilar groups, to calculate adjusted rates to take into account points of non-comparability.

(4) They have found a need to understand the theory of probability, to make significance tests.

(5) They have found it extremely important to understand the true relationship between a significance test and the problem at hand.

(6) They are concerned with problems of correlation, analysis of variance, curve fitting, and other subjects,—which, incidentally, are well in advance of the material usually taught in medical school.

Hardly any medical student wants, or can make use of, a thorough grounding in all these subjects. Nor would it be possible to teach this complete list of items in the time which can be allotted to statistical methods in the medical curriculum. What a student must acquire, however, is an understanding of the value and the limitations of a statistical presentation. He must learn to judge

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whether evidence presented in the literature is convincing or not. He must learn to distinguish between adequate and inadequate data.

Very few medical men can be expected to acquire great proficiency as biostatisticians. It is proper that this should be so, in the same way that not all doctors should become specialists in a particular field of medicine. But the converse analogy also holds. Just as any practitioner should understand radiology well enough to know where it should be applied, so should every student of medicine recognize the place where statistical analysis can be of use. It need not be pointed out that this ability can only come from a correct, even though general, understanding of statistical principles and methods. In this sense, *students* are considered to include all workers in the field of medicine—undergraduate, technical, clinical, practitioner, or administrator.

The need for the teaching of biostatistics is further made evident by conferences now being sponsored by the American Medical Association, to consider ways of educating the profession as a whole in this matter. It has become increasingly clear that much medical research work being done could be improved (1) by consideration of statistical techniques before the work is begun, and (2) by a proper analysis of data after these have been gathered. Faulty conclusions as a result of improper interpretation are by no means the only mistakes encountered. Many valuable data have been wasted simply for the lack of ability to use them in a proper way, or for lack of planning so that they could be used properly.

At New York University College of Medicine the course in statistical methods is taught in the Department of Preventive Medicine, and is required for all students. It is no longer the same as it was ten years ago, when biostatistics first became an established 30 hour course (a total of 30 lecture and classroom hours for each student). This is at least a healthy sign; without change there is no improvement. To begin with, the name "Biostatistics" has been discarded in favor of "Medical Statistics," which is presumed to be a less formidable term, not so likely in itself to frighten the sensitive student. Whether or not this was a sound move, is by no means above dispute.

Other changes represent new ideas in teaching and a revision of emphasis. The aim has been to make the course constantly less "mathematical," out of respect for medical men who are generally uncomfortable in the presence of the language of algebra and calculus. This cannot be carried to the extreme, however, and physicians must achieve a working familiarity with such terms as "significance test," "probability," "correlation," etc. The object is to overcome the student's fear of statistical vocabulary.

The question of whether the first year in medical school is the time to teach biostatistics has frequently been raised. It is quite appropriate that there should not yet be agreement on this score, in view of the fact that the subject is a relative newcomer to the curriculum. Arguments generally favor teaching statistics during the preclinical rather than the clinical years, when students are interested in problems in the abstract, and not yet concentrating on in-

dividual patients. During the clinical years (third and fourth) a student's interest is centered more on the individual case, and not so much on theory.

Biostatistics was at one time taught in the first trimester of the first year. It constituted the student's delivery into the medical world, so to speak. This had the advantage of establishing in his mind the importance of statistical methods in relation to other subjects, about which he would have a minimum of preconceived notions. A disadvantage, however, was that a student entering medical school naturally had to adjust to a multitude of new situations, and the end of the program was often reached before the adjustment was made. Moreover, medical vocabulary was so completely strange to him that some time had to be spent in explaining the meaning of everyday terms such as "erythrocyte count," "cholecystectomy," etc. At present the course is given in the third trimester of the first year, and the increased success in teaching the student has been clearly evident to all of the teaching staff.

Originally biostatistics included what we now prefer to place under two separate headings: (1) vital statistics, and (2) statistical methods. Vital statistics is considered as dealing with birth registration, mortality, and similar items related to public health. This is now covered in the fourth year instead of the first. The first year course, including those items bearing chiefly on medical research, such as variability of measurements, probability, significance tests, etc., will be described presently.

In their fourth year, students attend one or two vital statistics seminars as part of a four-week Preventive Medicine clerkship. The groups are small, including 10 to 15 students at a time, so that informal discussion is easy. Here, as elsewhere, methods receive more emphasis than figures. The procedures of birth and death registration, and communicable disease reporting, are more important than the actual values prevalent at present. The methods of calculating rates are related to the source of the data. Statistical publications are discussed, such as those of the Census Bureau, National Office of Vital Statistics, and State and Local Health Departments, so that the student will know where to go for figures when he needs them. Every effort is made to enliven the seminars, by having students themselves pore through volumes of vital statistics and tabulate data at a blackboard. Not without some effort can students be persuaded that statistics are not always dry and uninteresting.

In medical statistics in the first year, the single most important point made in the entire course probably is to understand the meaning of statistical evidence. Again and again, it is pointed out, for example, that lack of evidence of association between two factors is *not* evidence of lack of association between those factors. To put it in another way, a particular piece of evidence may aid in proving a certain point, but this by no means indicates that contrary evidence will be of any use in disproving that point. For example, if in an experiment 10 rabbits receive a given drug and not all 10 die, this is proof positive that the drug is not 100 per cent fatal; but if all 10 of them die, this is no evidence at all that the drug is 100 per cent fatal.

In some places the "horrible example" is a favorite device for teaching certain statistical principles. (Even up-to-date literature is replete with examples of inadequate or erroneous conclusions.) This method, however, has specific and important dangers. First of all, the student is apt to remember the horrible example more clearly than the explanation of what is wrong with it. The atmosphere is destructive rather than constructive, and although he may learn what not to do, he may not learn what to do. But more important is the fact that the student may easily be left with the impression that if an erroneous approach led him to one conclusion, the correct approach will lead him to the contrary conclusion. For example, let us suppose that we have observed the results of treatment of early syphilis with penicillin in a given form, and that among nearly 200 Whites, 46 per cent of the cases had a febrile reaction, while among some 750 Negroes only 40 per cent had such a reaction. The uninitiated might conclude that there is a physiological response in Whites different from that in Negroes. As it happens, this is a wrong conclusion. An ordinary significance test will show that a difference as large as that between 40 and 46 per cent could easily occur by chance. And now, unfortunately, there are those who would say: "Therefore, there is no difference between Whites and Negroes in reaction to penicillin." This conclusion is just as wrong as the one arrived at before. The proper conclusion is: *There is no evidence from these data that Whites are any more likely to run a temperature than Negroes as a result of this treatment.* Whether or not there is a physiological difference between the races in this respect is outside the province covered by the significance test. The clinician in this instance has only gained the knowledge that his conclusions cannot be based on the data given. He must seek other or additional evidence, either physiological or statistical. (A larger sample might, perhaps, produce a statistically significant difference.)

The regular first year course, now termed Medical Statistics, consists of 1 hour of lecture and 2 hours of laboratory work weekly, for 10 or 11 sessions. The two-hour classroom problem period for each hour of lecture is considered to be extremely important; so much so that one is inclined to wonder how a course in statistics can be taught successfully if the student does not have the opportunity to work some problems himself. The slide rule is the standard computing device. A good grade, 10-inch rule is insisted on, so that the student learns to consider it as an instrument of accuracy—not merely a guessing stick. For this reason, problems require some selection to insure that they do not require calculating machine accuracy to make a solution possible. (In the medical school it has been considered impractical to provide each student with a machine.)

Great emphasis is, and should be, placed on making the course interesting to the student. The principle is maintained that if it is well-taught it will be interesting, and for this reason student interest is a fair measure of how well the course is taught. Instructors in the laboratory promote informal discussion, rather than hold forth didactically. Discussion among students is encouraged particularly. The drawback of a noisy classroom is far outweighed by the ad-

vantages of an exchange of ideas. The student is made to feel that the instructor is not infallible. But he must also realize that to prove his point he must understand the difference between adequate and inadequate evidence.

In the writer's opinion it is best not to stipulate that the course in medical statistics be under the immediate direction of a doctor of medicine. Medical men with sufficient experience—or interest—in biostatistics are relatively scarce. An attempt to produce such duality by training may well result in a deficiency in one or the other characteristic. On the other hand, where the number of students requires more than one instructor, it is highly desirable, if not essential, that at least one, and preferably half of the staff be trained primarily in medicine and only secondarily in statistics. There are two distinct reasons for this. The M.D.'s point of view may frequently be quite different from that of a mathematician, and in a medical school the former should never be slighted. Secondly, it is valuable for the student to realize that his instructors in the course are not drawn only from that peculiar race *statistician*, but that an honest-to-goodness physician can also learn enough statistics to teach the subject.

It is desirable to provide one instructor for about every 15 students, but not to confine any instructor to a given group. The object is to impart knowledge to the student, and to develop reasoning power. The success with which this is done is a function of characteristics of both the instructor and the student. Instructors differ as much as students do, and for that reason an effort is made to give each student an opportunity to come in contact with every instructor. Because of the number of students, there are usually 3 or 4 instructors assisting in the laboratory. Instructors' conferences are held each week, on the assumption that the teachers as well as the students are still learning. The instructor who feels he has nothing more to learn in biostatistics is likely to be of less help to the student than one who can set an example of eagerness to dig to the bottom of a problem. Problems are so designed that they will maintain a serious student's interest. This means that a solution involves more than simply arriving at a given stereotyped answer. It may be quite appropriate that there should be several logical conclusions, depending on which of several legitimate approaches is made. If the student expects to find a given, predetermined answer, he will look only for the conventional approach. There will be little incentive for original thinking. But the other extreme is to be avoided also. If the problem raises only questions which cannot be answered, the student will lose interest.

The same thing applies to the attitude of instructors. If the instructor has a set response ready for each question, the course becomes uninteresting to him as well as to the student. But, on the other hand, if his only reply to a student is consistently of the nature of "figure it out for yourself," the student will soon avoid him. A judicious combination of the two is the ideal. The most successful instructor, and also the most popular, is the one who can say: "That's an interesting idea—let's work it out together,"—and who can skillfully arrive at a satisfying conclusion, leaving the student feeling that he did most of it himself.

To sum up, in teaching statistical methods, emphasis is placed on *why* rather than *how*. But it is definitely recognized that a proper understanding of *why* cannot be achieved unless the student also understands *how* statistical methods are applied. This knowledge can generally be imparted with a fair amount of success to undergraduate medical students. A more difficult thing is to persuade research workers experienced in medicine that there are newer techniques which they must learn and old prejudices which they must discard. Among those students who approach biostatistics with great misgivings, there are always a certain number who become enthusiastic converts. Sometimes this occurs only belatedly, when as interns or research workers they are obliged to deal with situations leading them to wish they had paid closer attention in lecture. The most enthusiastic supporters are those who have had an opportunity to use statistical methods to good advantage in solving real problems.

As an outgrowth of the greater awareness of the value of medical statistics, much teaching at the medical school of New York University is in the form of individual consultations on specific research problems. These consultations, within the College and outside, constitute an ever increasing proportion of the statistical activities of the Department of Preventive Medicine. The demand has led to the teaching of special classes for staff members of the medical school and hospital, which, in turn, has increased the amount of consultation work because of the larger number of research workers applying statistical methods.

A question which might well be considered is, "Must statistical methods necessarily be taught in preventive medicine?" These methods are applied more and more in other departments, such as physiology, pediatrics, bacteriology, radiology, surgery, obstetrics and gynecology, and even anatomy. Where they are taught is, perhaps, not of importance, as long as biostatistics includes (1) the teaching of statistical methods to medical students, (2) consultation service for research in the entire medical center, and (3) a source of research material for statistical problems.

## The Present Outlook for Neurology in the United States A Factual Evaluation

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What is the present outlook for neurology, particularly clinical neurology, in the United States? This is a provocative question and an answer cannot be given categorically. The solution must be sought from a careful scrutiny of available data collected on a nation-wide scale and evaluated against the historical background of neurology and in the light of current scientific and ideological trends.

Two distinguished physicians within the last two years have investigated certain aspects of the present status of neurology in this country, but their conclusions do not coincide in all respects. Dr. Percival Bailey,<sup>1</sup> in his Chairman's address to the Section on Nervous and Mental Diseases of the American Medical Association in 1946, stated that "clinical neurology had reached an all time low in this country." One year later Dr. Henry A. Riley,<sup>2</sup> in his Presidential address before the American Neurological Association, presented factual evidence which did not sustain all of the conclusions of Doctor Bailey. According to Riley, "clinical neurology is not a dying discipline and, contrary to other analyses, instead of being 'at an all time low' it has never reached a higher level of activity or productivity than at the present time."

In view of this variance in opinion of two leaders in the field of neurological science as to the actual status of neurology today, it appears timely to probe the problem further in order to see if any additional enlightenment can be found by tapping other sources of information. Before describing the methods used and results obtained in this investigation, it is fitting to review some of the past highlights in the rich heritage of neurology which might serve as a useful background for a consideration of its present status and probable direction in the future.

Neurology in the United States became of age after the Civil War.<sup>3</sup> Cradled in the pioneering spirit and precise methodology of European neurologists, particularly Romberg in Germany, Duchenne and Charcot in France, and Hughlings Jackson and Gowers in England, American neurology was reared on a firm structural basis. The American Neurological Association was founded in 1875, and superior medical minds were attracted to the discipline in this country. The movement was given a fresh impetus by the work of Sherring-

1. BAILEY, PERCIVAL: The Practice of Neurology in the United States of America. *J. A. A. M. Colls.* 21:281, 1946.

2. RILEY, H. A.: The Status of Neurology in the United States. *J. Nerv. and Ment. Dis.* 106: 262, 1947.

3. JELLIFFE, S. E.: Fifty Years of American Neurology. Semi-centennial Anniversary Volume of the American Neurological Association (1875-1924). Boyd Printing Company, Albany, New York.



ton (1906), which revealed an immense potential for the investigation of the physiologic and dynamic functions of the nervous system.

By the turn of this century neurology was distinctly on the map in the United States, and it showed considerable promise for future growth. However, clinical neurologists have always had one vulnerable spot in their medical logistics, namely: a disinterest sometimes appearing almost as disdain for a distinct neurologic therapeutics. They are usually regarded by their colleagues as diagnosticians par excellence and are rarely identified with innovations in the treatment of neurologic disorders.<sup>4</sup>

During occasional lags in the march of neurologic achievement, this indifference to therapy has tended to restrict neurologists to a narrow groove of activity, limited to diagnosis, survey, and nomenclature. However, in the past the neurologist has always managed to escape such a contraction of his activities by virtue of (1) new discoveries in neurology, (2) recognition of "new" diseases, such as epidemic encephalitis, and (3) the extension of his own interests into accessory fields of activity, as for example, the treatment of the psychoneuroses.

Neurologists were faced with the hazard of being relegated to such a limited groove of specialization just prior to World War I. In 1913 Dana<sup>5</sup> sounded a warning of impending danger. He maintained that general practitioners were appropriating many of the neurologists' special technics, that neurologic investigation was moving along narrower and less dramatic lines, and that the neurologist must expand his interests or "sink into the narrow niche of curator of the scleroses or an appraiser of teratological defects." Dana advocated that this expansion be made in the direction of the psychoneuroses.

At the time and during the decade after Dana spoke these words, Moore and Noguchi identified spirochetes in the brains of paretics, studies of the cerebrospinal fluid brought fruitful results, von Economo described epidemic encephalitis, encephalography and ventriculography were introduced, and neurologists did expand farther in the direction of the psychoneuroses—some of them to the extent of completely abandoning their neurologic practice. In brief, the clinical neurologist had escaped being classified as a curator of rare and incurable diseases.

Then again, a few years prior to and during World War II, the role of the clinical neurologist was again challenged. He still had not taken over the treatment of organic neurologic diseases and he was beset by two powerful developments, namely, the rise of the so-called "pure" psychiatrists<sup>6</sup> and the extension of neurological surgery into the field of medical neurology. The "pure" psychiatrists are the promulgators of present concepts, widely accepted

4. RILEY, H. A.: Training of the Neurologist: *Neuralgia Irredenta*, *Arch. Neurol. and Psychiat.* 29: 862-871, 1933.

5. DANA, C. L.: The Future of Neurology, *J. Nerv. and Ment. Dis.* 40:753, (Dec.) 1913.

6. WILSON, G., and RUFF, C.: Present Trends in the Practice of Neurology, *J. A. M. A.* 133: 509, (Sept. 22) 1947.



especially in Anglo-Saxon countries, that the essence of mental disorder resides in emotional tensions psychologically determined by interpersonal, social, and cultural madadjustments. The wide acceptance of these concepts has produced a slogan in certain quarters that basic training in neurology is not only unnecessary, but may even be detrimental to a proper understanding of the principles of psychopathology. Therefore, it is implied that neurologists should retire from active participation in this field.

The rapid and productive growth of neurological surgery has been accompanied by an entry of some neurosurgeons, desiring to round out their experience and practice, into the field of medical neurology. As a result, the medical neurologist is frequently by-passed in referrals, and his practice may suffer a diminution in the supply of neurologic patients.<sup>1</sup> Associated with this movement, one occasionally hears in some medical centers comment to the effect that all routine neuropsychiatry can be adequately handled by the psychiatrist and neurosurgeon without the assistance of a medical neurologist. This has given rise to additional slogans, such as: "Neurology is a lost art" and "The neurologist belongs to a dying race."

So we see again some evidence of events alien to a further expansion of the neurologist into the clinical field. Again he is confronted with the possibility of being restricted to the role of diagnostician and curator of rare and incurable diseases. How valid are these events and slogans which tend to delimit the activities of the neurologist? Are they transient or permanent, reversible or irreversible? How strong is the neurologist? What can be done to prevent a narrowing of his activities? Help in the elucidation of these questions is the principal object of the present investigation.

#### CRITIQUE OF PREVIOUS STUDIES

Percival Bailey,<sup>1</sup> from his study of the practice of neurology in the United States, maintains that: (1) neurologists are losing the psychoneuroses to the more psychologically inclined psychiatrists; (2) neurologists are losing much non-surgical neurology to neurosurgeons; and (3) the teaching of neurology in medical schools is quite inadequate. The conclusions thus reached were determined as the result of answers to questionnaires sent to all neurosurgeons, neurologists, and neuropsychiatrists certified previously to the summer of 1945, and to the deans of all medical schools in the country.

The neurologists were asked to report on the percentage of their practice devoted to and the percentage of their income derived from strictly organic neurology; the neurosurgeons to furnish facts relative to the percentage of their practice and income arising from non-surgical neurology; and the deans of medical schools were asked to give information concerning their facilities for instruction in neuroanatomy, neurophysiology, and clinical neurology, together with the names of the teachers of these subjects.

Although physicians' reports on percentage of type of practice and amount

of income derived therefrom may well reveal conditions as to type of practice at a given time, nevertheless, they may or may not be a valid indicator of an enduring trend. Estimates of percentage of type of practice, particularly as it relates to psychogenic disorders, involves many variables difficult to evaluate, and is subject to transient social and economic influences. In times of modern warfare public attention becomes sharply focused on unusual psychic reactions, the psychoneuroses, personality disorders, psychopathic personalities, and acute transient psychotic states. Even strict organic neurologists are affected by the pulsations of an intense psychic era and are apt to shift their orientation toward the psychologic side, and assume an even greater psychiatric practice to meet the demand. In this connection, it is interesting to note that only 16 per cent of the scientific papers presented at the annual meeting of the American Neurological Association in 1914 dealt with essentially psychiatric subjects, whereas 32 per cent of the scientific papers presented at the annual meeting at the end of World War I in 1919 could be considered as being essentially psychiatric.

The study of Dr. Bailey was made during the final phase of World War II, at a time when the treatment and rehabilitation of emotional maladjustments arising during wartime occupied the center of the neuropsychiatric scene; and it may be added at a time when large sums of money were in circulation. If and when the tensions of war decrease and national economy stabilizes, it is to be presumed that the large number of emotional maladjustments related to the war will decrease or become chronic. The occurrence of either or both is no boon to private psychiatric practice, and it is reasonable to assume that the practice of many neurologists and neuropsychiatrists will in time revert to a more organic perspective. Therefore, a survey of the percentage of practice and income of neurologists and neuropsychiatrists during a given year of extraordinary events would be suggestive but not conclusive of a definite trend to the effect that neurologists and neuropsychiatrists are deserting the practice of neurology, unless correlated with additional data.

Doctor Bailey's demonstrations that neurosurgeons are penetrating deeper into medical neurology are, indeed, convincing and in accord with routine observation. But does this development, apparently under way, have endurance value? Doctor Bailey's estimates indicate that on the average 59.7 per cent of the neurosurgeons' patients have nonsurgical neurologic disorders and that 17.5 per cent of their income is derived from this source. From these figures it is evident that the vast source of the neurosurgeon's income is derived from surgery in spite of his large nonsurgical clientele. Other things being equal, would this not favor the future expansion of the neurosurgeon into surgery rather than into medical neurology?

Doctor Riley,<sup>2</sup> as the result of his study, sees no justification for the extreme pessimism expressed by Doctor Bailey—at least as far as the present status of neurology is concerned. To prove his point, he graphically depicts the steady progress made in all forms of neurologic activity at the Neurological

Institute of New York. Upon considering his study, one immediately poses the question as to whether the progressive trend at the Neurological Institute is characteristic of trends in other parts of the country. The Neurological Institute may be considered the standard bearer of American neurology, but it may or may not be a reliable indicator of neurologic trends in other parts of the country, as Doctor Riley himself implies in his paper.

In view of current disagreements and in consideration of the significance of the problem for the future of neurology, it was believed that some illumination could be added to the subject by procuring supplementary information from other channels.

#### METHOD AND PRESENTATION OF DATA

A questionnaire was mailed to physicians certified in either neurology alone or in both neurology and psychiatry prior to July, 1947, by the American Board of Psychiatry and Neurology. The intent of the questionnaire was to supply information to the Department of Medicine and Surgery of the Veterans Administration concerning the number and availability of qualified neurologists for the care and rehabilitation of disabled veterans. The questionnaire was accompanied by a cover letter from the Chief Medical Director of the Veterans Administration which emphasized the pressing need of qualified neurologists for the care of veterans and which urged cooperation in returning a completed questionnaire.

Included in each questionnaire was space for each neurologist or neuropsychiatrist to (1) state age; (2) give address; (3) designate type of Board certification, i. e., neurology, psychiatry, neurosurgery, or any combination of these; (4) designate chief interest, i. e., neurology, psychiatry, neurosurgery, or other; (5) indicate by a check whether current practice was devoted mostly to neurology, neurosurgery, psychiatry or other; (6) check if in private practice and if affiliated with a teaching institution; and (7) list names and addresses of neurologists and neurologists-in-training associated with them who are not diplomates of the American Board in neurology.

The questionnaires were mailed to all known diplomates in neurology and in both neurology and psychiatry prior to July, 1947. This list, which was obtained from available sources at that time, comprised the names of 900 diplomates. It is estimated that, owing to recent deaths and inability to locate correct addresses, about 850 diplomates actually received a questionnaire.

When the returned questionnaires were received, the diplomates were grouped in order to determine: (1) predominant interest—whether in neurology, psychiatry, neuropsychiatry, neurological surgery, or any combination of these; (2) comparative ages of neurologists, psychiatrists, neuropsychiatrists and neurological surgeons; (3) correlation between predominant interest and type of current practice; (4) correlation of predominant interest, with percentage participation, in teaching institutions; (5) correlation of predominant interest, with percentage participation, in full-time clinical and administrative positions; (6) correlation of predominant interest and participation in special activities be-

yond the call of routine practice; and (7) relative geographical distribution of neurologists, psychiatrists, neuropsychiatrists, and neurological surgeons.

After these data were collected and correlated, a study was made of lists, published in the Archives of Neurology and Psychiatry, of all diplomates certified on examination in neurology and in psychiatry and in both psychiatry and neurology from 1935 through 1946. The number certified annually in each of these specialties during this period was estimated.<sup>7</sup> The number certified annually in neurology alone was added to the number certified annually in both psychiatry and neurology to determine the nature of any trend which might indicate an increase or decrease in the absolute number of diplomates certified in neurology and in both psychiatry and neurology as compared to the absolute number of diplomates certified in psychiatry alone between 1935 and 1946.

Finally, the per cent of the number of diplomates certified in neurology and in both psychiatry and neurology among the total number of diplomates was calculated to determine whether or not there had been a relative increase or decrease in the number of this group as compared to the per cent of diplomates certified in psychiatry alone from 1935 through 1946. Graphic charts were made to illustrate the nature of any discernible trends.

Another indicator to gauge the growth or decline of neurology through recent years is to compute the increase in the number and geographical distribution of hospitals approved for training in neurology by the Council on Education of the American Medical Association and to compare the increase of these approved residencies with progress made in similar direction by other specialties, such as psychiatry, neurological surgery, and internal medicine.

Accordingly, the Educational Numbers of the *Journal of the American Medical Association* from 1935 to the present time were consulted to evaluate the nature of any increase in number and geographical distribution of hospitals in the United States approved for residency training in neurology by the Council on Education of the American Medical Association. The results obtained were represented graphically and compared with a similar study of the development of hospitals approved for residency training in psychiatry, neurological surgery, and internal medicine.

#### RESULTS

At the time this study was begun, 521 (about 60 per cent) had returned a completed questionnaire.<sup>8</sup> This list includes 48 diplomates certified in neurology alone, 456 certified in both psychiatry and neurology, 15 certified in both neurology and neurological surgery, and 2 certified in both psychiatry and neurology and in neurological surgery.

7. These estimates may not be absolutely accurate, since the names of those certified in 1944 were not published, and resort had to be made to informal lists. However, the estimates are considered sufficiently precise to indicate trends.

8. Since this study was begun, 80 additional completed questionnaires have been received, making a total of 601, or about 67 per cent of the 900 mailed out. An evaluation of the 80 additional questionnaires is not included in the present study, but a preliminary examination does not indicate that they would alter the net results in any material way.

## PREDOMINANT INTEREST

Tabulating the replies from the 521 completed questionnaires, we find that 26 per cent of the total (exclusive of a small number predominantly interested in neurosurgery) are primarily interested in neurology, 47 per cent report that their chief interest is in both neurology and psychiatry (neuropsychiatry), without signifying any preference for either discipline, and 27 per cent state that their principal interest is in psychiatry. (See Fig. 1.) If we add the number of neurologists to the number of neuropsychiatrists, we can say that 73 per cent of a large sample of diplomates, certified in either neurology or in both psychiatry and neurology, declare an interest in neurology, without demonstrably subordinating it in any way to any interest they may have in psychiatry.

From the data obtained, the median ages of the neurologists, neuropsychiatrists, and psychiatrists, are 46, 47, and 45 years, respectively. There is thus a tendency for those interested in psychiatry to be somewhat younger. The percentage of neurologists, neuropsychiatrists, and psychiatrists in various age groups is represented in Table 1.

TABLE 1.—PERCENTAGE OF NEUROLOGISTS, NEUROPSYCHIATRISTS, AND PSYCHIATRISTS IN VARIOUS AGE GROUPS.

Age Groups Years	Chief Interest Neurology	Chief Interest Neuropsychiatry	Chief Interest Psychiatry
25-34	8.5	9.0	4.4
35-44	43.0	39.7	52.9
45-54	26.1	27.3	20.5
55-64	21.6	16.1	16.1
65-85	18.0	7.9	5.1

The data, as they are presented, also reveal that current practice as reported is for the most part in consonance with major interest. Thus, 53 per cent of the neurologists state that their practice is mostly neurological, and 82 per cent of the neuropsychiatrists report a predominantly neuropsychiatric practice. Eighty-nine per cent of the psychiatrists report a practice mostly psychiatric and the remainder divide it between psychiatry and neurology. If we couple the replies from the neurologists with the replies from the neuropsychiatrists, we find that 69 per cent of this group indicate that their current practice is either predominantly neurological or at least not subordinated to psychiatric or other type of practice.

The preponderant number of neurologists serving in some teaching capacity is striking. Reviewing the relative percentage from the various groups of individuals, we find that 69 per cent of the neurologists, 36 per cent of the neuropsychiatrists, and 33 per cent of the psychiatrists are affiliated with teaching institutions. In this category of teachers, however, the psychiatrists and neuropsychiatrists belong to a younger age level than the neurologists. For instance, among the neurologists the average age of the part and full time teachers is 46 years and 66 per cent are below 50 years of age; among the neuropsychiatrists

45 years with 78 per cent below 50 years of age; and among the psychiatrists 45 years with 73 per cent below 50 years of age.

The neurologists are less prone to occupy full-time clinical or administrative positions. There are 11 full time clinicians (8 per cent of the total) among them as compared to 24 (10 per cent) among the neuropsychiatrists, and 22 (16.2 per cent) among the psychiatrists. Again, among the neurologists there is only one full time medical administrator in contrast to 15 (6 per cent) among the neuropsychiatrists and 8 (6 per cent) among the psychiatrists.

The neurologists exceed in participation in special activities beyond the call of routine practice. Twenty-nine, or 22 per cent, of them, report participation in special activities as compared to 13 (5 per cent) of the neuropsychiatrists and 14 (10 per cent) of the psychiatrists.

In proportion to the size of their group, the neurologists give a larger list of names of neurologists or neurologists-in-training, associated with them, who are not diplomates of the American Board in neurology. They gave a list of 140 names, the neuropsychiatrists 151, and the psychiatrists 102.

The psychiatrists are represented in a greater number (31) of states than either of the other two groups, even though the neuropsychiatrists as a group are almost twice as large. The neurologists are represented in 27 states, and the neuropsychiatrists in 30. Although the states lacking representation vary somewhat in all three groups, the general areas showing a deficit representation are about the same for all groups. They are the extreme Northeast, the South, the Rocky Mountain States and the Northwest.

Little can be deduced from the replies of the neurological surgeon predominantly interested in surgery, since only a few of those certified in neurological surgery are also certified in neurology. Of this group, 12 returned completed questionnaires. Their average age is 45 years. Only one states that his current practice is both in clinical neurology and neurological surgery without indicating any predominance. The remainder signify that most of their practice is surgical. All but 4 are affiliated with a teaching institution on a part time basis.

#### CERTIFICATION BY THE AMERICAN BOARD

The sum total of diplomates certified on examination in neurology only and in both psychiatry and neurology for each successive year from June, 1935, through December, 1946, were estimated from lists published in the Archives of Neurology and Psychiatry and other available sources. The numbers for each two year period from 1935 to 1946 were then calculated, and are depicted graphically in Figure 2. It will be noted that the absolute number of these diplomates reached an all time high in the years 1939 and 1940. Then a decline set in during the early and middle part of our participation in the war, which was followed by a slight renaissance during the latter part of the war and the first year following the cessation of hostilities. In the decline during the early part of the war, however, the number still remained above the original base line set in 1935 and 1936.

FIG. 1.—COMPARATIVE PERCENTAGE OF DIPLOMATES PREDOMINANTLY INTERESTED IN NEUROLOGY (N), PSYCHIATRY (P), AND NEUROPSYCHIATRY (NP).

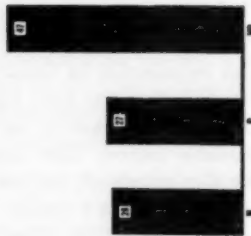


FIG. 2.—NUMBER OF DIPLOMATES CERTIFIED ON EXAMINATION IN NEUROLOGY (N) AND NEUROPSYCHIATRY (NP).

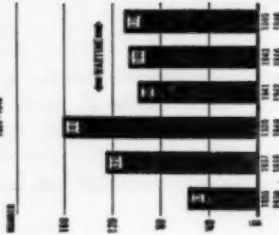


FIG. 3.—NUMBER OF DIPLOMATES CERTIFIED ON EXAMINATION IN PSYCHIATRY.

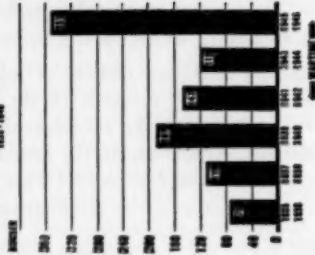


FIG. 4.—PERCENT CERTIFIED ON EXAMINATION IN NEUROLOGY (N) PLUS NEUROPSYCHIATRY (NP) OF TOTAL NUMBER EXAMINED ANNUALLY.

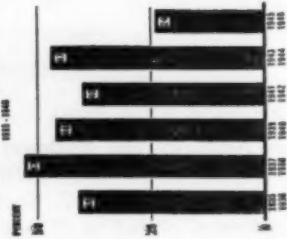


FIG. 5.—NUMBER OF APPROVED HOSPITALS FOR TRAINING IN NEUROLOGY.

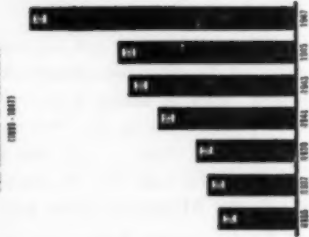
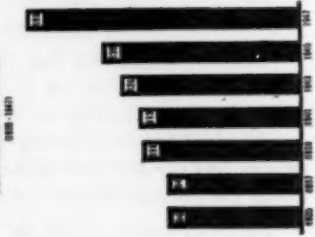


FIG. 6.—NUMBER OF APPROVED HOSPITALS FOR TRAINING IN PSYCHIATRY.



The number of diplomates certified in psychiatry only was estimated in a similar manner, and the results are shown graphically in Figure 3. Here again one notes that psychiatry reached a peak in the years 1939-1940 and then in turn slumped during the war years until the period 1945-1946, when it shows



a tremendous rise. The number certified in the period 1945-1946 is over four times as great as the corresponding number in the period 1935-1936.

The relative standing in terms of per cent of certification in neurology plus both psychiatry and neurology as compared to per cent of certifications in psychiatry only is delineated in Figure 4. It can be noted that the number exceeded that of psychiatry in the period 1937-1938, then continuously declined except for a slight comeback in the period 1943-1944, and finally precipitously descended during the period 1945-1946.

#### APPROVED HOSPITALS FOR RESIDENCY TRAINING

The number of hospitals approved for residencies in neurology for each year from 1935 through 1947 was obtained from published lists in the *Journal of the American Medical Association*. The number of approved hospitals for training in neurology then were grouped in periods of two successive years and are portrayed in Figure 5. Perusal of this figure will demonstrate that the number of approved residencies in neurology increased by two during each two year period from 1935-1939; then increased by 7 from 1939 to 1941; retarded its rate of increase to five from 1941 to 1943 and to 2 from 1943 to 1945; and then rose to an increase of 16 from 1945 to 1947. This latter sudden increase is to be partially accounted for by the organization of new residencies under the Veterans Administration.

A comparison of the growth in number of approved hospitals for training in neurology was made with that of neurological surgery. The number of hospitals with approved training for neurological surgeons comprised a meager six in 1935, increased by five from 1935 to 1937 and by six from 1937 to 1939, slumped to an increase of three from 1939 to 1941 (at a time when medical neurology was enjoying a boom), regained its stamina by increasing by seven from 1941 to 1943 and by six from 1943 to 1945, and finally by twenty-five from 1945 through 1947. The number of approved hospitals in neurological surgery was only half of those in neurology in 1935, but equaled the latter in 1945 and surpassed them by 10 in 1947. Neurological surgery apparently received a greater stimulus from the war than did neurology.

The increase in the number of approved hospitals for training in psychiatry is depicted in Figure 6. One remarks that the number does not increase until 1939, when it rises by 17 and then shows a slow but sustained upward trend until 1945, when it rises precipitously. The proportional growth of approved hospitals for psychiatry has proceeded at a slower pace than for either neurology or neurological surgery. For instance, since 1935 the increase in number of approved hospitals for neurology is 243 per cent, for neurological surgery 866 per cent, and for psychiatry only 105 per cent.

Looking in the direction of internal medicine, we find that there were 134 hospitals approved for residency training in 1935, 201 during the first year of the war, 246 in 1945, and 377 in 1947. This represents an increase of 179 per cent. The rise of approved residencies in internal medicine, therefore, is also proportionately less than for neurology and for neurological surgery.

If we examine the geographical distribution according to states, of hospitals approved for residency training in neurology, we find that in 1935 seven different states had hospitals approved for such training. If we turn to the year 1947 we find that the number of states with approved hospitals for neurological training has increased to 16 (an increase of 129 per cent), including the District of Columbia. The areas in which there are no approved hospitals for training in neurology correspond roughly with those in which there is currently a dearth of neurologists, namely, the extreme Northeast, the South, the Rocky Mountain States, and the Northwest.

Approved hospitals for training in neurological surgery in 1935 were confined to four states, i. e., Illinois, Massachusetts, New York, and Virginia. Each of these states had one approved hospital, except New York, which had three. In 1947 the approved hospital list for neurological surgery expanded to include 23 states (which represents an increase of 475 per cent). In general, the geographical distribution of hospitals approved for training in neurological surgery is considerably wider than that of neurology. This is particularly evident in the South.

In 1935 there were 19 states which had approved hospitals for training in psychiatry. In 1947 this number had increased to include 32 states, the District of Columbia and Hawaii. The actual number of approved hospitals for training in psychiatry have increased from 93 to 197, an increase of 112 per cent, from 1935 to 1947. Therefore, the relative increase in both geographical distribution and number of approved hospitals in psychiatry has been less than that in either neurology or neurological surgery.

#### COMMENT

Let us now see what pertinent material may be sifted out of this collection of reports and figures. Our attention is directed toward a discernment of valid factors which play a role in the determination of the present status and future prospects of neurology. Using this point of departure, the data presented in the previous pages are classified as follows: (1) data which have a positive value for the advancement of neurology; (2) data which have a dubious value in this respect; and (3) data which have a negative value. Upon the completion of this classification of values an endeavor is made to appraise the total picture as it applies to the future outlook for neurology.

#### POSITIVE VALUES

An essential requisite for continued growth in the field of neurology is the presence of a genuine interest in this discipline on the part of qualified neurologists and neuropsychiatrists. The present investigation reveals that 73 per cent of a large sample of certified neurologists and neuropsychiatrists declare an interest in neurology which is not subordinated to their interest in psychiatry or in any other activity. The average age of this group is 46 years and approximately 50 per cent of them are under 45 years of age.

Can these signed declarations of interest by certified neurologists and neuropsychiatrists be considered as unequivocally reliable? Perhaps not entirely so!

There may be some neuropsychiatrists who pose as neurologists in name without functioning as such in practice. According to my experience, accumulated on the basis of recent tours throughout the country, this form of sophistry is rare. Perhaps it was more prevalent in the past, when there was a tendency to give psychogenic disturbances a maximum of organic coloring. But in the present psychologic era, at a time when the principles underlying functional and psychosomatic disorders are widely displayed in both the medical and lay press, and at a time when there is an abundance of psychologically-minded patients, there appears to be little advantage for psychiatrists to pose also as neurologists.

Granted then that there is a basic interest in neurology among a large number of qualified neurologists and neuropsychiatrists, it is pertinent to inquire about the amount of their influence and the extent of its distribution. The number of these men actively affiliated with teaching institutions could be justifiably regarded as an indicator of influence. Our data demonstrate that 70 per cent of those predominantly interested in neurology are actively affiliated with teaching institutions, whereas only 33 per cent of those chiefly interested in psychiatry have equivalent affiliations.

Now what is the age of these teachers? Do they make up a group of older men or are their age levels consistent with many years of future productivity in the growth of neurology? The data reveal that their median age is 46 years and 66 per cent are below the age of 50 years. This certainly does not suggest that neurological teachers as a group belong only to the "old school." It is true that teachers in psychiatry belong to slightly lower age levels. Modern psychiatry with its therapeutic bent, its many innovations, and its aggressive spirit has maneuvered itself into a favorable position for enticing younger men to join its ranks. Nevertheless, the age levels of teachers of neurology drawn from this sample appear favorable for a potent exertion of their influence.

The next question that arises is whether the influence of these teachers is spreading, declining, or remaining stationary, from a geographical point of view. A consideration of the relative increase in the geographical distribution by states of approved hospitals for training in neurology suggests a proportionately greater geographic expansion of approved hospitals for neurology than for psychiatry, in spite of current psychiatric advancement which has resulted from a forceful development of the psychogenic theory of disease and from the stimulation afforded by the apparent high incidence of the war neuroses.

Another positive sign suggesting a steady growth in neurology is the progressive increase over a period of years in the actual number and geographical distribution of hospitals approved for residency training in neurology. These hospitals have increased over threefold since 1935. This is proportionately a greater increase than is found in the case of either psychiatry or internal medicine. It does not equal, however, the increase in the number of hospitals approved for training in neurological surgery, the youngest and perhaps the most vigorous specialty in the domain of mental and nervous disease.

To the positive values already enumerated, another factor should be added. It has not been subjected to careful factual analysis, but it is a matter of common observation and is especially apparent to the writer, since one of his duties is to recruit as many neurologists as are available for the Veterans Administration. The present demand for well qualified neurologists is well in excess of the supply. The large number of neurological casualties resulting from the war has accentuated this demand. The inevitable result of this mounting demand should be the production of more clinical neurologists, and this means an expansion of the general field of neurology.

#### DUBIOUS VALUES

According to the data received from the questionnaires, reports as to whether the amount of current practice was mostly neurological or psychiatric or a combination of the two followed in the majority of cases the line of predominant interest. Thus the majority of neurologists state that their current practice is mostly neurological, the psychiatrists signify psychiatry as the principal portion of their practice, and the neuropsychiatrists report a practice divided between neurology and psychiatry without indicating any predominance of one over the other.

On the surface it would appear that these reports should favor the present status of neurology inasmuch as they tend to refute other observations (1) suggesting that neurologists and neuropsychiatrists are losing much of their neurologic practice to neurosurgeons. As previously suggested, however, estimates by physicians of their predominant type of practice are not necessarily valid for establishing definite trends. Different types of practice, particularly psychiatric, are subject to transient economic and cultural influences. Moreover, there is no strict uniformity of opinion as to when a disturbance is strictly psychiatric, strictly neurological, or a combination of the two.

The accuracy of the responses in our questionnaire to the request that the physician designate the specialty to which he devoted most of his current practice is especially subject to question. In the questionnaire the physician was asked merely to check whether his current practice is devoted mostly to neurology, psychiatry, neurological surgery, or other branch of medicine. Exact percentages were not requested, though they were gratuitously given in a few instances. Many checked both neurology and psychiatry without indicating any relative preponderance. This was the quick and easy way, and the method apparently adopted by many in the filling out of questionnaires. But it most certainly led to false responses in borderline cases, and probably some frank misstatements in other instances due to lack of attention. Accordingly, although these replies may be suggestive, yet they are not in any way conclusive.

Another report of doubtful value concerns the size of the lists furnished by the recipients of the questionnaire, of neurologists or neurologists-in-training, associated with them, who are not diplomates of the American Board. The 131 neurologists presented a list of 140 names; the 242 neuropsychiatrists furnished a list of 151 names. The combined groups produced 291 names, considerably

less than one name per man. Unless qualified, this is not very encouraging. But it is quite a chore for busy attendings or consultants to write out the full names and addresses of neurological residents under their supervision. Evidence to this effect is revealed by the fact that in numerous replies it was advised that lists be obtained from the Registrar of the medical school, from certain hospitals, deans of residents, etc. Lists procured from these latter sources are not included in this study, and consequently it is believed that the size and character of these lists derived from the questionnaires are not necessarily representative.

#### NEGATIVE VALUES

The lack of drive on the part of most neurologists to initiate measures of therapy for neurological disabilities is a historical fact and a weakness which has been manifest during difficult periods in the development of modern neurology. The idea of the neurologist as a pure diagnostician still persists today. This study produces no objective evidence as to the truth of the neurologist's alleged lack of therapeutic orientation, but it has been reiterated so often in the literature that its veracity can almost be assumed. Some action by leaders in neurology who direct training programs might alter this state of affairs. A golden opportunity is at hand for such a move in the rehabilitation of neurologically disabled veterans.

Another situation detrimental to the present standing and future growth of neurology is the apparent lack of adequate facilities for the teaching of neurology in many medical schools. This fact has been demonstrated and deplored by Percival Bailey<sup>1</sup> and others. Some action on the part of leaders in neurology to advocate a subsidy for the neurologic departments of certain medical schools is in order.

Perhaps the most serious manifestation to catch the eye of a possible downward trend in neurology is the paucity of the number of physicians certified in neurology (N) and both psychiatry and neurology (PN) as compared to the number certified in psychiatry during 1945 and 1946 (Fig. 4). The outlook appears even more ominous if the examinations held in May, 1947, are any gauge of the shape of things to come—154 certified on examination in psychiatry as compared to a total of 23 for both neurology alone and in psychiatry and neurology.

However, the sudden diminution of certifications in neurology and neuropsychiatry by the American Board might not be as serious as it appears at first glance. It may well be a temporary expression of the aftermath of the war. During the war medical departments of the Army, Navy, and Public Health Service went all out for psychiatry. The war neuroses and situational maladjustments presented a glaring problem. Most courses in military neuropsychiatry subordinated neurology almost completely to psychiatry. Many young medical officers, with and without previous experience, were made psychiatrists by directive and sent to these courses. Some "board" credit was given for work done under adequate supervision at certain military stations. There were many

more approved stations in psychiatry than in neurology. The essential tempo and orientation of military neuropsychiatry was psychiatric in the psychological sense, and it was to be expected that many returning medical officers would seek certification in psychiatry alone.

Added to the above was the policy adopted by certain government agencies immediately after the war to increase by 25 per cent the salaries of full time physicians if they were diplomates of an American Board. This action stimulated a rush of many full time psychiatrists in government employ (some of them had been administrators for years) to be certified in psychiatry.

Both of these events may be more of an expression of post-bellum expediency than indications of a permanent numerical change in the type of certifications to be granted in the future by the American Board of Psychiatry and Neurology.

#### CONCLUSIONS

As the result of this study and the work of others, it is apparent that neurology as it stands today has both assets and liabilities. Its chief assets are: (1) evidence of a significant interest in neurology among a large number of qualified neurologists and neuropsychiatrists; (2) evidence that these interested individuals belong to an age group consistent with energetic action, and they occupy positions of influence; (3) evidence that there has been a steady growth both in the number and geographical distribution of approved hospitals for residency training in neurology; (4) evidence that this growth of approved hospitals for training in neurology is proportionately greater than that of either psychiatry or internal medicine; and (5) evidence that the present demand for qualified neurologists is far in excess of the supply.

The principal liabilities of neurology are: (1) its lack of a therapeutic orientation; (2) the inadequate facilities for undergraduate instruction in neurology in many medical schools; and (3) the recent sudden drop in the proportionate number of physicians certified in neurology (N) and psychiatry and neurology (PN) by the American Board of Psychiatry and Neurology.

It is concluded that the assets outweigh the liabilities, since the first two liabilities may be eliminated by a more effective organization in the field of neurology, and the third is considered to a large extent as an expression of post-war expediency rather than a valid indication of a definite trend.



## **An Experiment in Instruction in Health Education for Undergraduate Medical Students\***

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With the accelerated application of mass educational techniques to the problems of health, only too frequently insufficient emphasis is given to the importance and effectiveness of the close personal relationship of the "teacher" and the "student" in adding to knowledge or in influencing behavior. In the minds of some persons, health education is synonymous with the saturation of a community with pamphlets, advertising materials of all sorts, lectures, radio talks, movies and other audiovisual devices.

It is true that the efforts of the public health nurse and, to a lesser degree, those of the physician trained in public health are directed to the supplying of health information and to motivating those individuals with whom they have contact toward healthful living. Nevertheless, the key individual in all matters of health, the practicing physician, all too often is neither experienced nor trained to carry on the precision type of educational activity which inevitably makes up a sizeable proportion of his daily practice. As preventive measures are introduced to a greater and greater degree into the day by day practice of the physician, the need for greater appreciation, knowledge and control of the elements of health education becomes more and more apparent. Although a few medical schools in this country are making some effort to equip their graduates in this area, the efforts thus far are certainly not adequate to the need.

For a period of ten years, Long Island College of Medicine has conducted an experiment in the clinical instruction of undergraduate medical students in preventive medicine. The mechanism of this instruction, namely, the "Clinical Clerkship in Preventive Medicine," has been described at previous meetings of this conference. About one year ago, among other innovations in teaching content and precision, an effort was made to approach this problem of instruction in health education with the assistance of two voluntary health agencies located in New York City, namely the National Health Council and the Health Insurance Plan of Greater New York. A plan was worked out for seminar discussion of those phases of health education which particularly affect

\*Presented before the Conference of Professors of Preventive Medicine, November 8, 1948, Boston, Massachusetts.



the practicing physician. At the outset it was considered wise to concentrate on the exploration of the proper methodology for such teaching. Accordingly, three hour seminars were scheduled for each group of 10-12 medical students who spend one month of their fourth year assigned to the preventive medicine clerkship. The authors of this presentation shared responsibility for the leadership of the discussions, although the brunt of responsibility was borne by those specially qualified in health education. An effort was made to keep the discussions as informal as possible and this was accomplished despite the fact that the proceedings of each seminar were recorded completely. These recordings were subsequently transcribed.

To date, approximately 12 such discussions have been held and the following presentation is a progress report of some of our observations and experiences.

The justification of the doctor as health educator hardly needs elaboration for professors of preventive medicine, nor, indeed, for organized medicine as a whole, which has, through the years, maintained that the medical practitioner, in his day-to-day direct relationship with patients, has an excellent opportunity to influence for healthier living.

However, Mr. S. S. Lifson, assistant director, Community Organization of the National Health Council, and I have been most fortunately honored in being granted an opportunity to examine the degree to which fourth year medical students are prepared to fulfill their role as health educators. It is this examination, highlighted by the actual comments of the students themselves, which we feel will be of interest and importance to you.

Before discussing specific strengths and weaknesses of the student's preparation for imparting knowledge, and guiding health practice, it is necessary to describe the nature of health education as we see it, and against which we have measured the comments and attitudes of the medical students.

What we are most concerned with here are not the principles of teaching. Paradoxically, we are concerned with the patient, the learner. For an understanding of how people learn is the best preparation for understanding how to "teach."

Dorothy B. Nyswander, professor of health education in the School of Public Health at the University of California, has described learning succinctly. "To learn is to undergo change. There are many kinds of learning. One type is the acquiring of new information about a subject. This is the simplest type of learning. Merely imparting information is also the easiest kind of teaching. Such learning achieves changes on the intellectual level.

"Another form of learning leads to changes in attitudes. It may not necessitate learning new facts, but it does imply that there is a drastic rearrangement of what is already known so that new feelings, new emotions, new sentiments are built up. Overcoming fear of pain and fear of the dark are examples. This kind of learning results in changes on the emotional level.

"Still another form of learning leads to acquiring new habits—new ways of doing things. We learn to change our habits of eating, or learn to play the piano. Such learnings mean that changes involving both nerves and muscles must take place.

"In health education we are concerned mostly with the kinds of learning which result in changed attitudes and habits.

"We find that people may comply when ordered or directed to do something. This compliance is no guarantee, however, that when left on their own they will continue to follow the rules laid down.

"We have learned that the ego or self of each person is his most important possession. This self is his life and his hope of life. This self does not flourish under criticism, sarcasm, unfair comparison with others, nagging or dictation. It grows only when it is treated with respect and dignity.

"We know, too, that the human organism is dynamic. It wants to reach out, to participate in all that is going on. It rebels against accepting decisions in the making of which it has had no part. It wants freedom to select or reject what is offered. The human being also wants to understand the purpose for making a change. He must be motivated from within himself. He must foresee and obtain satisfaction from his learning."

Making three assumptions for the moment, (1) that the doctor knows what knowledge and guidance he wishes to offer; (2) that he would prefer his patients to act upon his advice; and (3) that he would like patients to return to him for future medical care and health guidance—this understanding of learning raises a wide variety of imperative questions.

Is the doctor aware of the range of information he might at various times impart, of the aids and assistance community resources offer to him? Is he aware that how he says something to a patient may have much more significance for the patient than what he says? And does he recognize that actions accompanying words may result in the individual learning something quite different from what was intended? Does he appreciate the multiplicity of things one learns from even a single experience?

Does the doctor recognize the importance of initial contacts and impressions? Is he aware of the significance in the learning situation, of cleanliness, light, ventilation, space, decoration, etc., of his waiting room and office? Are greetings, and explanations of delay or of procedures considered as part of the learning process? What role does the receptionist or nurse play in the total setting?

Again, is the doctor prepared to understand the tensions which a person brings to the physician,—patient relationship,—and can he evaluate relative abilities of comprehension and speeds of learning?

And above all, if the doctor recognizes the importance of all these questions, is he ready, easily, to take the positive action necessary to fulfill his role as an effective health educator?

The 3 hour discussion periods with more than 100 fourth year medical students, in groups of 10, reveal two major facts. Among these students there is (1) a basic unawareness of the significance of the doctor in health education, individually in his office, in the school system as consultant or participant, and in the community as authority and resource; (2) a weak appreciation of the learning process, and of what makes for the soundest learning in a doctor-patient, or any medical situation. Springing from these two major facts, the discussions revealed the following:

1. Marked differences of opinion about the nature of the doctor's responsibility to the patient.
2. A wide variety of differences about whether to invite or even answer questions by patients, about what to answer or explain—and how to accomplish any of these.
3. Confusion about when or whether a person or a symptom is to be treated.
4. Uncertainty about the very mechanics of welcoming new patients—and other aspects of initial contacts. The lack of opportunity to study or observe practicing physicians in action with private patients, or to assume such a role while students for the purpose of critical analysis and evaluation.
5. Expressions of inadequacy in relation to specific training for realizing the educative ideals and goals of preventive or constructive medicine.
6. Expressions of appreciation for the discussion periods as a method of learning, and for the focus on an aspect of medicine deemed important by the students, yet largely neglected in the rest of the curriculum.

Time does not permit extended quoting from the transcriptions of these discussions which would be necessary to illustrate each of these findings. Yet they are revealed again and again in successive discussions. The following brief segments from several discussions illustrate one or two of them.

*Student:* I think the doctor should insist that patients come in at least twice a year for routine physical examinations.

*Student:* The personal relation of patients and physicians should be such that the physician can urge patients to come immediately when they have any unusual symptoms.

*Student:* I don't think the doctor should have such a responsibility as you fellows think; because, for one thing, he doesn't have the time. The doctors who could disseminate the information haven't got the time.

*Discussion Leader:* Do you think, ideally speaking, that the doctor being the doctor, should be the one to give that information?

*Student:* Ideally speaking, yes, but under the present medical set-up, you can only allocate so much time to every patient. You cannot disseminate information.

*Student:* You wouldn't need so much time to explain the importance of coming in as you would to try to give them a course on how to be a doctor. I think you could just mention a few diseases and show them how slight the symptoms are. If nothing else, you could scare them into coming in.

*Student:* As far as what someone said before goes—that a doctor just doesn't have the time to advise a patient about a particular disease he may have. I think every doctor should take it upon himself to make the necessary time.

*Student:* You say that the doctor doesn't have time to teach his patient, aside from treating whatever disease the patient happens to have at the moment. I have found today, in speaking to doctors, that patients, at least in the middle income groups, demand an explanation. They won't just take treatment per se. They

want to know what's the matter with them; they want to know how it affects their bodies; and what the prognosis is; and what they could have done to prevent themselves from getting it; as well as any complications that are going to come along. They want to know and they will ask you. If you don't tell them, they will go to someone else who will.

*Student:* And you can tell them within 10 or 15 minutes.

*Discussion Leader:* I would like to ask whether or not anyone agrees with these gentlemen on my left—that the job can be done and that he will be able to do it?

*Student:* Only if you educate the doctor in medical school to that fact.

*Discussion Leader:* Have you been so educated?

*Student:* No, I don't think so.

*Student:* If you mean a doctor should shoulder the burden of educating his patients, I certainly don't think that's his problem at all. I definitely think it's his duty to explain to each person whatever his problem is, but I don't think he is responsible for anything more than that—morally or ethically.

#### Another segment of discussion:

*Discussion Leader:* Do you give the patient an opportunity to ask questions?

*Student:* Yes, definitely.

*Student:* I would encourage him to ask questions. Otherwise, what may happen was shown yesterday where a doctor examined a patient and then missed the fact that he had .....

*Discussion Leader:* This gentleman here says no. Would you say you would take time to answer a man's "secondary" questions?

*Student:* From what I have seen general practitioners are so rushed that they haven't got time for any discussion like that.

*Student:* The chief complaint is what you are going to be concerned with. Last summer I worked in a private hospital. Quite a few of the patients there didn't have the least idea of what was being done for them. They would ask me and I would take out 5 or 10 minutes to explain things very superficially. They would be happy and very satisfied.

*Student:* You could conduct yourself in such a way as to discourage questions beyond those concerning treatment of the main problem.

*Discussion Leader:* Could you do that in such a way that you would not antagonize the individual?

*Student:* Well, perhaps the doctor can say, "I feel I'll be able to tell you more about this the next time we see each other."

#### Another segment of discussion:

*Discussion Leader:* Suppose someone came to you for treatment of a broken arm, and then subsequently returned for check-ups. Would you consider discussing how he is using his leisure time, or his diet?

*Student:* I would.

*Student:* I would not. A man who is in the practice of medicine is not a visiting nurse.

*Student:* If you show a little interest in how your patient is living, that makes him feel that you are interested in him.

*Student:* That's all very true. In other words, though, when a patient comes in with an ingrown toenail, are you going to spend the rest of the day telling the patient how to live? Is it practical?

*Student:* You'd never make any money.

*Discussion Leader:* Recognizing the economic needs of the physician, let us nevertheless pose the opposite side of the question. Are you going to say that your sole concern is to patch up, cure, alleviate whatever the presenting symptoms or illnesses are, and that when you have done that you have done your job. Or are you going to recognize another obligation, as physicians with special knowledge, to extend understanding in ways of healthful living.

*Student:* The problem comes down to a philosophy, and to me it's part of preventive medicine. When a patient is in my care and some of these other aspects involved in medical disease arise, I regard them all as part of my sphere.

The following is an example of the discussion leader's attempt to focus the discussion:

*Student:* I think we had a good idea before. People in general ought to have a better idea of what goes on inside their bodies. You can't expect the individual physician to give much education on a one-to-one basis. For one thing he probably doesn't have the time. For another thing, it doesn't necessarily follow that because he is a physician, he is a good educator. That's an assumption that is too frequently made; we can attest to that in medical school. There are very good physicians who are pretty poor teachers. I'm sure we all know examples of that.

*Discussion Leader:* I think your remark should impel us to a discussion of what learning is and how people learn. I think it is going to be a little less fruitful if we proceed on the basis of assuming that education involves certain verbal explanation or instruction as the major technique. I believe if you think for a moment you will realize that people learn not necessarily by the printed word. They learn in total situations, and they learn by contact, by experience, and by observing things.

Take a mother who brings her child to the physician, and the physician listens to John's heart while the mother stands hovering by. The physician listens and listens, and it is deadly quiet for some time. He shakes his head a little bit; it doesn't mean much to him; then he straightens up and doesn't say a word. The mother is very, very anxious—What had the doctor heard? He says, "It's nothing; don't worry; it's a slight murmur; don't restrict Johnny's activities." Now he has told her in so many words that it's nothing, a slight murmur, which she doesn't understand, and not to restrict Johnny's activities. She takes little Johnny home, and because of the seriousness with which the doctor listened to Johnny's heart and the way he presumably with intent brushed aside her obvious anxiety and desire to ask questions, she is convinced that Johnny has something very seriously wrong with his heart, and that the doctor wouldn't tell her because he was afraid it would frighten her. So she restricts Johnny's activities when she shouldn't actually. And it's likely she'll visit another physician, or search out a "heart specialist."

I was in a doctor's office recently and a man came in with a child in his arms. The doctor did not attempt to ingratiate himself with the child, which he could very well have done because I know the physician well and he is a sympathetic man, but he was busy and not thinking of the significance of his actions. He proceeded directly to examine the child, who did not cry though he might have wanted to. There was something wrong with the child's mouth. The doctor looked inside and named the condition for the father. I didn't quite catch the name of the disease, but it was a technical word. The father was perturbed but he still didn't feel free to ask the doctor what it was. The doctor sensed somewhat the fact that he had to say a few more words, so he grudgingly added, "It comes from the baby sucking on unsterilized nipples." Well, you could easily observe, as I could from where I was sitting, that the father was quite upset by this remark, but the physician was busy writing out the prescription, and that was about all the time he had to give to this individual. Finally, the man blurted out—"But we do sterilize the nipples." And by the very manner in which the man said this the doctor realized that the man was taking it as a personal affront, and he realized that very likely the man was sterilizing the nipples. To save himself a bit, he said, "Well, the baby puts other things in his mouth, too. He may have picked up some toy that had been contaminated, or something of that nature." And he relieved the man. It is quite likely that if the man had not blurted out what he did, or had the doctor been less perspicacious, the man might have left without this additional explanation. What he learned in a situation like that is not simply the name of the disease and what to take for it, but he also learned that an experience in the doctor's office was an unpleasant one. What I am trying to say is that in a situation like this some learning is going on all the time. We all agreed at the beginning, we want people to turn to doctors. Not only do they avoid doctors because they don't understand the science behind an M.D. degree, they also avoid doctors because of very unpleasant experiences they have in doctors' offices, sometimes because of the physicians themselves.

So, let's go ahead now with a discussion of what you think the doctor can contribute in office situations which will help a person learn. But go beyond

what I have been saying also, because there are many instances where you might give specific information."

Often the question of using simple language to explain matters to patients arose. There was a difference of opinion as to whether or not the students, without special training, could accomplish this. Several attempts by students to describe how they might explain blood pressure variations to patients resulted in complete failure, as well as merriment in the group. In addition, the value of simplified sketches in certain instances was agreed upon, yet sketching the heart in order to make clear some circulatory disorders resulted in an amazing variety of diagrams, some comprehensible, others not! A student observed, "Four years of medical school do not prepare some of us to tell things to patients in a way they will understand."

One surprising fact that each of the discussions revealed was the difficulty every group of at least 10 students had in spelling out what they felt people should know and do to achieve and maintain a reasonable level of health.

Since these discussions were a new experience for the students as well as the discussion leaders, a conscious effort was made to obtain student reactions to the session. Some typical comments follow.

*Discussion Leader:* We would like very much, looking at this as objectively as possible, if you would share with us your thinking about this discussion. Has it meant anything to you? What can we do to improve the session?

*Student:* Perhaps you could inform us a little more about the help general practitioners can get from the community in their efforts to educate patients. You informed us a good deal about what the community will expect of us. I think that is really important.

*Student:* I certainly think that the seminar is the best way to teach a subject like this.

*Student:* Another point which strikes me is the crying need for health education. The one who needs it most, I think, is the doctor. He needs to be better educated in how to present his technical knowledge to the people in a way that will make it possible for the technical information he has to be used in a practical way.

The students were eager to define their responsibilities, and in the main they tended to accept the broader concepts of modern preventive medicine. But one general observation holds true for all. That the way these new doctors would deal with patients, and the extent of their adaptation to differing individuals in the interests of more effective treatment and guidance, would depend upon their personal feelings and not upon specific training in understanding and techniques for the purpose of making their ultimate medical influence count—and endure.

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## A Successful Training Program for House Officers on a Private Medical Service

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The Barnes Hospital in St. Louis, built in 1914, is designed for the general care of medical and surgical patients. Because of its close affiliation with Washington University Medical School, teaching of students is done on the open wards. There is a one year straight medical service for interns and a one and two year period of training for assistant residents. Until the separate private medical service was established, the house staff served on both the ward and private services.

Since 1925, the Barnes Hospital has increased its bed capacity from 282 to the present number of 435, but this enlargement consisted of 129 additional private beds whereas but 24 were added to the ward services. By 1942, the disproportion of beds between the ward and private services presented a serious problem in the training of medical house officers in that some were required to spend as much as 7 months on the private pavilions. During that period, their time was so taken up with routine work, that little was left for formal training. As a result, the number of good students applying for a medical internship at the Barnes Hospital diminished materially.

To meet this situation a plan was devised to separate the private from the ward service. In order to attract students for internships on the private service, a teaching program was set up wherein attending physicians committed themselves to active participation. The details of the organization finally adopted are as follows.

The private house staff consists of a resident physician, 5 assistant residents and 8 interns—approximately the same quota as assigned to the ward service. The attending physicians are divided into 7 groups, arranged in such a way that the average hospital census of each group is more or less equal. However, an effort is made to combine in single groups those physicians particularly interested in the various medical specialties such as cardiology, gastroenterology, metabolism and diseases of the chest. These assignments are not rigid and an attending man may, after consultation with the resident, be shifted from one group to another.

Each intern serves for about 6 weeks on each group. The remainder of the year is spent in the general hospital laboratory, and on 2 weeks' vacation. In the laboratory the intern is instructed in the various chemical and bacteriological techniques commonly used in clinical medicine. At night he is responsible for all emergency laboratory procedures.

Each attending physician who has a substantial number of patients is, by arrangement, given a "rounding time." This, in some instances, is one-half hour; usually, one hour, but never longer. At the beginning of each 6 week



period, he receives a notice designating the intern and assistant resident assigned to his group. Those who admit few patients meet their intern, by arrangement, outside of the regular "rounding hours."

Thus, Dr. A is scheduled to make rounds from 10 to 11 A. M. On his arrival his intern is awaiting him. During his rounds Dr. A. devotes his attention not only to the patient but to his intern and assistant resident. This is his teaching assignment. When the hour is ended, if rounds are not completed, the intern excuses himself if he is to meet another physician; otherwise, he may complete the round. The appointment system is the crux of the teaching program. The advantage to the attending men in having a single intern constantly assigned to him personally is sufficient to induce him to maintain his rounding hour, and the system results in mutual benefit to both physician and house officer.

In order to facilitate contact between the visiting doctor and his intern and assistant resident, the hospital has assigned an office and a full time secretary to the private medical service. The secretary's duties are to inform herself of the whereabouts of members of the private house staff, to locate physicians on rounds for telephone calls, to find consultants, to keep informed of all medical admissions, and to make out bills for services on request. The work is so heavy that two telephones are required in her office. If a physician sends a patient to the hospital he may telephone the medical secretary to locate his intern or he may leave a message concerning admission orders.

Each assistant resident alternates through the seven groups and is responsible for one or two of them according to the schedule of rotation. He serves one term in the private outpatient department where he works up all cases before they are seen by the attending private physician. When on the hospital service he is responsible for admission notes on his patients, and supervision of his intern. He makes rounds with whatever attending man he may choose on his own service. One assistant resident serving his second year in that capacity is appointed "first assistant." He replaces the resident when occasion arises and is permitted several months off service for research. The resident physician also frequently engages in clinical research.

The Physician in Chief of the hospital is responsible for both the ward and private services. Under him is a Director of the private medical service, a part time attending physician who is provided with an office and a secretary. He is in immediate charge of the private service. He initiates policies, maintains close contact with the resident, attends the weekly history meeting, meets with the assistant residents once a month, and discusses policies and problems with the Physician in Chief. Major problems are brought to the attention of a Private Medical Committee of eight attending physicians appointed from the staff by the Physician in Chief. This committee serves in an advisory capacity and meets on call of the chairman. By rotation of its members, about every two years, an increasing number of the attending staff becomes acquainted with details of the administration and objectives of the service and has an opportunity to participate in the formulation of policies. The Director of the hospital,

Physician in Chief, and Director of the service are ex-officio members. Such a committee lends authority to the regulations necessarily imposed on the attending staff who are informed of changes by memoranda issued from time to time by the Director of the hospital at the suggestion of the committee.

Teaching activities, beside personal instruction, consist of the following. A clinical-pathological conference for the joint ward and private house staffs to review autopsies is held weekly. Grand Rounds for members of the attending staff is conducted once a week. Patients from both services are presented, and the assistant resident on the case works up and recites the clinical data. A weekly clinical-pathological conference for the attending staff and students, as well as a formal clinic are given weekly; both ward and private house staffs attend both of the exercises. History meeting on the private service is followed by presentation of interesting cases. This latter conference is conducted by the staff man whose patient is discussed. Once a week an hour is devoted to roentgenographic demonstrations of selected films from patients on both the ward and private services. The films are discussed by a member of the Department of Radiology. Two other activities have been initiated by members of the private house staff—a journal club and a biweekly evening meeting, wherein one member gives a formal presentation of a selected subject followed by general discussion by the house staff and one or two attending men who are invited specifically to participate.

At the outset, this plan offered a serious problem to the hospital trustees, for it meant enlarging the house staff, which together with the salary for a secretary, involved considerable expense. However, increased personnel has offered a means for a quicker turnover of medical patients. At present there are approximately 100 private medical beds, and admissions average about 70 a week. Many of the patients admitted need urgent attention, and they now receive adequate care from the augmented house staff. After six years of operation, the hospital trustees and Director consider the financial investment well worth while. It is apparent to all that the professional excellence of the private medical house staff is due largely to the active teaching program initiated and maintained by the attending physicians.

At first, the caliber of applicants was not impressive, because of the usual stigmata attached to a private service, but as the program developed, the service became more and more sought after. An applicant for internship or assistant residency in medicine is asked to designate the ward or the private service as his first choice. An increasing number is requesting the latter, and this year an assistant resident from the ward service chose to serve his second year on the private service.

Since rising operating costs are forcing many hospitals throughout the country to curtail their charity beds and increase accommodation for private patients, and since private services as organized in most hospitals are distinctly inferior to ward services as training grounds for medical house officers, it has seemed advisable to report the foregoing plan of organization of a successful teaching program on a private medical service.

## The Nature of Biophysics and the Responsibilities of a Department of Biophysics

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Research in the biological and medical sciences grows increasingly dependent on physical and physicochemical tools, many of them of great technical complexity. The public, as well as biological scientists, become increasingly aware of the usefulness of electronic amplifiers, of photo-electric devices, of electron microscopes, of radioactive tracers and so on in medical research, as well as of those electrical and mechanical aids in diagnosis and therapy that have long been in use. With this increasing awareness of the role that the physicist can play, in medical and biological fields, the term "biophysics" is heard more and more.

Biophysicists are awaking to the danger that this might lead to a general misunderstanding of the term "biophysics;" that it may be understood as meaning merely the application of physical tools to medical research and to therapeutics, and that the much wider and more fundamental scope of their branch of science and learning may be forgotten. Their own wider interpretation is in line with a great historic tradition of biophysics and of biophysicists, in which they desire to play their part.

Biophysics has a great tradition, established by such men as Galvani, Poisson, Helmholtz, Faraday, Young, Otto Franck and a host of others as eminent in physics as in the biological sciences. Nor has the tradition been broken, when we have modern leaders such as Professor A. V. Hill. The early leaders did not, of course, call themselves "biophysicists" for the division and subdivisions of science that have occurred were still largely unknown, and expediency had not driven us to that degree of specialization that we must deplore for many reasons. Why, then, can they be considered as the great biophysicists? Not merely because they happened to use the tools of physics to investigate the problems of biology. But because they shared a faith that the phenomena of life were governed by "physical" laws, as well as by "chemical" and "physiological" principles, and that these physical laws would ultimately be found to be identical with those operating on the inanimate world, though yielding seemingly very different behavioral results because of the unfamiliar complexities of the structure of organisms. They were biophysicists because they thought about the biological behavior they observed in terms of the laws of physics and of mathematics, just as the biochemists thought about the same phenomena in terms of chemical laws.

"Physiology" used to mean, as the great founders understood it, "the science of the functioning of cells and organisms" just as "morphology" was the study of their structure. We have seen one limb after another break off from the parent tree and start an independent existence. Pharmacology, biochemistry,

neurophysiology, comparative physiology, cellular physiology, general physiology, nutrition, endocrinology and a host of others, of which we may not yet have heard, fill the pages of the Year Books of our universities. Are the biophysicists now trying to split off yet another part of physiology? If so, is it not time to halt this process, lest the parent tree be impoverished too much, and the "pure physiologist" find himself left with no proper field of study? This question is one of great concern at the moment to those who are devoted to physiology.

We need to review the scope of physiology and see whether there is not some more logical subdivision into a few major branches, each conscious of its relation to the other, rather than into the many categories that often owe their existence to something as trivial and superficial as a special technique of investigation. I suggest that such a scheme of logical subdivisions exists, and that already some universities, among them our own, are moving toward its adoption.

We have said that physiology is the study of the functioning of cells and organisms. On what main factors does this functioning or behavior of cells and organisms depend? I think we can state three main factors.

1. Cells and organisms behave according to their chemical constitution and are governed by the chemical laws. The corresponding branch of physiology is biochemistry.
2. Cells and organisms behave according to their physical constitution and according to the physical laws. This branch of physiology is "biophysics."
3. But much more than this, the behavior of cells is profoundly modified by the fact that they are not isolated, but are part of a community of cells bound together in an "organism" and this modification is mediated by "organizing" and "integrative" factors. Some of these we know as the nervous system with its reflex activity and the hormones. Others, like the organizing factors in growth and development, remain fascinating mysteries. The branch of physiology mainly concerned with this could be called "integrative physiology" (unless the term "organismal physiology" were to be tolerated). It is the branch in which such men as Claude Bernard, Sherrington and Cannon have been pre-eminent.

According to this view, biophysics would have a status equivalent to that now given to biochemistry, and both, with "integrative physiology" would form one coherent discipline. This type of division is at a different level from many of the existing categorical schemes. For example, pharmacology and pathology are divisions made according to particular sets of conditions to which cells and organisms are submitted (drugs and injurious agents), while cellular and plant physiology represent divisions according to the particular classifications of the living material which is the object of study. Organization for research is purely a matter of expediency for administration and for provision of facilities and, fortunately, research itself cannot and should never be confined to any system of compartmentation. Organization for undergraduate medical instruction, however, is a matter of greater importance not merely because of the greater

restraints of providing facilities and administration, but because the type of division into compartments adopted inevitably influences greatly the views of the student as to scope, meaning, and interrelation of the various courses they take. Too often, they fail to see the unity that exists, because of the trivial difference in manner of presentation or nomenclature.

It must, therefore, be strongly emphasized that the establishment of departments of biophysics should be initiated only where simultaneously there is a closer integration between the courses in physiology and biochemistry. In our own school, as in a few others, we have already recognized the unity of "physiology" as a whole by formally combining the courses of physiology and biochemistry into one interlocking two year course of "physiology and biochemistry." It is possible that we may one day call the course "biochemistry, biophysics and integrative physiology." More probably, when the place of biophysics in the triad has been recognized, we will go back to the original meaning of "physiology" and simply call it that.

With this view of the nature of biophysics, it becomes an easier task to define the functions of a department of biophysics in a medical school.

#### FUNCTIONS OF A DEPARTMENT OF BIOPHYSICS

As for every other department, these can be divided into duties concerned with teaching and with research, though of course each of these should be undertaken by all members of a department since the practice of each (teaching and research) so greatly improves the performance of the other.

*Teaching Duties.*—Include both graduate and undergraduate teaching. Undergraduate teaching in biophysics should not be segregated into any separate course, but be an important part of the integrated course of physiology (or "physiology and biochemistry"). Many of the aspects of physiology regularly taught to undergraduates are mainly biophysics, for example, the electrocardiograph, hemodynamics, temperature regulation, energy metabolism and heat exchanges, muscle heat, much of sensory physiology and conduction in nerve. In these subjects the department of biophysics should take part in the teaching of the regular courses. We have found, also, that having a department of biophysics justifies the possession of many instruments such as accurate pressure recording apparatus, amplifiers, cathode ray oscillographs, electromyographs, etc. (constructed primarily for research, and otherwise out of reach of most physiologists), which enable demonstrations of bioelectric phenomena to be given to undergraduate students. These demonstrations impress the principles and facts on the students' minds as no amount of lecturing could do. Moreover, biophysical apparatus often makes possible demonstrations on human subjects where otherwise animals have to be used, and the much greater interest of the average medical student in the reactions of the human is enlisted in his training. For example, a student is likely to remember the inhibitory cardiac effect of carotid sinus stimulation, demonstrated on a human subject in a cardio-tachometer before the whole class, much better and longer than from the animal experiments usually shown.

It is, however, at the level of graduate teaching that the biophysicist should be able to make the greatest contribution. Physicists, of necessity, have facility with mathematics and the biophysicist should be able to impart a working, rather than an academic, knowledge (so difficult to persuade the mathematicians to give!) of the statistical design of experiments and statistical evaluation of results. Elementary "theory of measurements" should also be taught. It is now realized that these are essential for all research workers in biological science. The department of biophysics might as well also give optional courses in mathematical subjects not usually considered as suitable, yet of great value in modern research. These are the elements of calculus (which is certainly not a branch of higher mathematics as so often thought, but actually a very simple subject) and the use of logarithms, the slide rule, the exponential curve, and so on. The experts in these subjects, the pure mathematicians, are seldom temperamentally able to give these to medically trained workers with any degree of interest and practical results, while the biophysicist can confine instruction to what is useful and, by illustration with biological examples, make it of interest.

To seminars and discussion of advanced physiology, a biophysicist should be able to bring a fresh breeze of critical demand for exact definition and quantitative study, and help dispel the mists of technical verbiage and clouds of "classification" with which anyone primarily trained in medical subjects is tempted to conceal fundamental ignorance. The biophysicist is less likely to think that classification advances explanation or that putting it into Latin or Greek should satisfy the curiosity. (Note the sedative effect on many physiologists of saying that it was a case of "inhibition" or of "after discharge"). Of course, the biophysicist should, at the same time, learn from his colleagues in other branches of physiology to beware of the oversimplification and of the ignoring of the specificity of biological behavior, to which he is very prone.

A still greater contribution to the research in all departments can be made by a biophysicist, provided he has tact as well as special knowledge, for by his training he is acquainted with a great variety of ways of measuring things, of some of which his colleagues may never have heard. The devising and exact use of instruments is the field in which the physicist should be the expert. Thus the department of biophysics should serve extensively as a "consultant on measurement" for the whole body of the medical research at any institution. Advice and practical assistance should be given without any implied or open suggestion that this involves any obligation to receive special credit or co-authorship. Such advice is part of the regular duties of such a department.

A major obligation of a department of biophysics is, of course, the training of biophysicists. At the present time the facilities for such training on this continent are far too limited to supply the demand for trained men in medical research and teaching. At present, training in biophysics should be only at the graduate level, though later in our evolution, specially oriented undergraduate courses may be feasible. It has been general experience that training in physics and mathematics should come first, and the training in biological sciences be overlaid, but the possibility of adding the necessary training in the exact sciences



to one who is already a well trained biologist should not be excluded. Our own experience is that for the graduate of physics and mathematics, or of physical chemistry, the taking of the undergraduate courses in histology in particular, and in physiology and biochemistry, together with supervised reading in biophysics, should produce one worthy of the name of biophysicist. Such training should lead to a Ph.D. degree in biophysics.

*Administrative Duties.*—One administrative duty that obviously should be undertaken by a department of biophysics in a medical school is the supervision of an instrument shop where apparatus for research can be constructed and repaired. This is where separate departmental workshops are, as is usually the case, out of the question because of the high capital costs. Often investigators have brilliant ideas for new instruments or other apparatus, and because of a lack of elementary knowledge of instrument design, and sometimes of exactly what they wish to measure, they waste considerable time and materials of the instrument shop in unproductive trials. Tactful suggestions by a biophysicist can often eliminate such waste, and he is in a much better position to help than is the instrument maker in charge of a workshop, for the biophysicist has some knowledge of what purpose the instrument is to serve as well as of design in general. It is usually desirable for some member of the faculty to have responsibility for the operation of an instrument shop, and the biophysicist is the logical choice, without any need for his department to have any proprietary interest or special privileges of precedent.

*Personnel of a Department of Biophysics.*—At the head of such a department it would seem that the best man would be one with the double training and research experience in physics and mathematics, and in the fundamental biological sciences. His training in physics should be broad, rather than in the very specialized branches of physics now in vogue (such as radiophysics). For example, he will be handicapped as a biophysicist unless he has a real grasp of energetics, and an interest in thermodynamics. Facility with mathematical ways of formulating ideas is also of great help. Other permanent members should, I suggest, in addition to this kind of scientist, include a physical chemist, to make the liaison with biochemistry more smooth. Some who have the fundamental outlook of the biologist, with training in physics overlaid, will help to correct the tendency of some self styled biophysicists (notably some physicists who have dabbled with the effect of radiations on living things) to ignore the complexity of the material under study.

The department should undoubtedly possess a permanent radio technician, for the electronic apparatus now in use by physiologists is so technically differentiated, that even the biophysicist cannot be expected to adjust it and keep it in repair at short notice, though he must understand the principles on which it is operated. I have long ago given up trying to keep abreast of the latest classification by numbers and letters of commercially available vacuum tubes, though I still, I think, can explain the function of the "control grid."

*Research.*—It should be foolish to specify any limits to the kind of research,



in the department, that should be carried on. However, there should certainly be research in fundamental biophysics, as it has been described here, rather than the mere application of physical "gadgets" to research on other problems. When he confines himself to the latter, a biophysicist is inviting the view that he is only a "glorified technician," and there are so many fundamental biophysical questions of the greatest importance that have not even been investigated (far from being solved) that he should be tackling these. As an example, our own department is investigating the physical and physicochemical equilibrium of the wall of blood vessels. The question of how a blood vessel constricts is not settled for the biophysicist by knowing that the circular fibres of smooth muscle of the wall shorten and so the lumen is made smaller. He must know how much tension is developed in these fibres to decrease the lumen by what amount, and what role the size of the lumen at the time, and other factors, may play. This is research in biophysics, whether we use amplifiers and phototubes and galvanometers or not. (Actually we are using the simplest types of apparatus.)

#### CONCLUSION

It seems inevitable, as we review the rise of biochemistry to its present status in the medical school, that biophysics will follow a similar evolutionary course. The new addition (not really new at all) to the family of physiology has been welcomed and given a name, but there is a grave danger that the child will be raised a technician rather than an independent investigator, will be sent to a Polytechnic Institute rather than to a university, and though occupying a useful place in the community of scientists, will fall short of the exalted station in life occupied by his illustrious biophysical forebears. Biological science will be the loser if this danger is not realized and avoided.

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**Association of American Medical Colleges Opens Its Medical Film Institute**

Dr. Walter A. Bloedorn, dean of George Washington University's School of Medicine and chairman of the Audio-Visual Committee of the Association of American Medical Colleges, announced the opening on April 28 of the Association's Medical Film Institute, with offices in the Academy of Medicine building, 2 East 103rd Street, New York City. In making the announcement Dr. Bloedorn said, "The Medical Film Institute has been acutely needed for at least a decade. It is our conviction that medical education will gain important impetus from the establishment and steady growth of this operating arm of the Association of American Medical Colleges."

Set up for the purpose of fostering high standards in medical film production as regards to scientific content, educational values and cinematic qualities as well, the Medical Film Institute is staffed by Dr. David S. Ruhe as director, Warren Cheney as executive officer, plus several consultants including Bernard V. Dryer, John Ross Roberts and Dr. Adolph Nichtenhauser. Speaking of the manner in which MFI will operate Dr. Ruhe pointed out that the new organization is not a film producing agency, nor does it intend to become one. Neither will it undertake to distribute films nor act as a film library. Rather, the MFI is essentially an advisory body which will function in a consultant capacity. It will provide film producers with several kinds of consultant services, upon request it will make utilization estimates should sponsors or producers wish an authoritative opinion concerning whether and in what

ways a proposed film would integrate into a medical education program, be it preclinical, clinical, postgraduate, professional or lay in purpose. Under certain circumstances, the MFI may elect to sponsor a film, but such occasions are not expected to arise often, and any films made by MFI would be strictly experimental productions.

Typical of one kind of consultant service provided by the Medical Film Institute is the task now under way as a commission from the U. S. Department of State requiring MFI to select a group of the newest and best medical films suitable for showing abroad as part of the United States Information Service film program. Dr. Ruhe indicated that this initial evaluation service for the State Department is to be an integral part of a long-range program of comprehensive film appraisal and cataloging which is to be one of MFI's basic activities.

As an indication of the international role which MFI may play, the National Cancer Institute's contract with the Institute provides that MFI will serve as its supervisory agent in the making of a cancer film in collaboration with the National Department of Health and Welfare of Canada. The picture, now in the planning stage, will actually be made by the Film Board of Canada, is for the lay public, tracing the progress of medical research in the war against cancer. It will be made in a two-reel version for study groups, and, in a ten minute release for theatrical distribution. Working title: "The Scientist Versus Cancer."

As a matter of fact, the Medical Film Institute has come into being as the result of over three years' planning on

the part of the Committee on Audio-visual Aids of the Association of American Medical Colleges, aided by the Inter-Departmental Committee on Medical Training Aids of the following government agencies: the War Department, Navy Department, Department of the Air Force, Veterans Administration, and the U. S. Public Health Service. This collaboration between a committee representing the medical educators, on the one hand, and a committee representing a large segment of medical film producers on the other, has proved to be not only logical and practical, but it has meant that the MFI begins its career with a well thought out program with facets of activity of interest to both makers and users of medical films.

A service now being organized by Dr. Ruhe and his staff having particularly vital import for producers is the MFI Medical Film Production Information Service. As those in the business of producing medical films well know, there has been an exasperating lack of a central clearing house which would supply information concerning medical films both projected and in work so that duplication, overlapping, and unnecessary competition could be avoided. Now, it seems, MFI will undertake to eliminate this lack, and will attempt to establish as complete an information service in the field of medical pictures as can be maintained, a service which will be available to any and all film makers, sponsors and educators to whom it may be of use.

The Medical Film Institute starts operations with a very distinguished group of medical experts, educators, and film makers as its Advisory Committee. In addition to Dean Bloedorn of George Washington University's School of Medicine, the committee includes Dr. Francis Keppel, dean of Harvard's Graduate School of Education; Captain Robert V. Schultz, M.C., USN., Chief of BuMed's Audio-Visual Training Section and chairman of the Interdepartmental Committee on Medical Training Aids; Orville Goldner, former head of Navy Training Films, Washington; Dr. Wil-

liam A. Benedict, chairman of the American Medical Association's Committee on Medical Motion Pictures.

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#### Licensure Statistics

The Journal of the American Medical Association, May 21, publishes a comprehensive survey and analysis of data pertaining to licensure. Of special interest to medical schools are the data dealing with the success of their graduates before licensing boards. The report covers 70 medical schools in the United States. Of that number, 19, represented by 1,242 graduates did not have any failures. Sixteen schools, represented by 1,815 graduates, had 27 failures. Ten of these schools had only one failure; 3 had two failures; 1 had 3 failures; 2 had 4 failures. The percentage of failures ran from 1.0 to 1.9. Thirteen schools, with 888 graduates, had 31 failures. The percentage of failures in this group ran from 2.1 to 4.4. The greatest number of failures was 4 for any one school. Two schools had one failure; 6 schools had 2 failures; 3 schools had 3 failures; 2 schools had 4 failures. Twelve schools were in the 5.0 to 10.0 per cent failures group. They were represented by 1,000 graduates, 75 of whom failed. The failures by schools were: 14 for one school; 13 for one school; 8 for 1 school; 7 for one school; 6 for two schools; 5 for two schools; 4 for one school; 3 for two schools and 1 for one school. Often the failure of one graduate will give a percentage of 9.1 failure. Therefore, these figures must be considered from every angle before accepting a high percentage of failures as an indication of bad import.

In the last group of schools with failure percentages ranging from 10.0 to 32.0, there were 10 schools, represented by 268 graduates of whom 44 failed. The highest number of failures for one school was 10 or 27.8 per cent. The school with 32.0 per cent of failures, had 8 graduates fail. The school with 18.7 per cent failures had only 3 graduates fail. The school with 15.0 per cent

failures had 8 graduates fail. Then, too, these data do not show whether more than one failure may not have been incurred by one individual, as has often been the case. In fact, one graduate may run up a high percentage of failures by taking licensing examinations before more than one Board. Perhaps it would be more nearly correct to use the word "applicants" instead of "graduates." However, since the reported failures number only 179 out of 5,213 examinations, failures should not be taken too seriously. Every school should make a careful check of what is reported for its graduates.

Totaling the whole number of failures for all graduates (including those who did not fail) the percentage was 3.43. For only those graduates who did fail, the percentage was 4.5.

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#### Financial Aid for Medical Education

Since 1910, the medical colleges of this country have been almost completely converted from poorly equipped proprietary schools with part time teaching staffs only to university schools with teaching hospitals, research laboratories and full time staffs. The various foundations of the country have invested in this conversion between 60 and 100 million dollars; 31 states and 3 cities have contributed perhaps 250 million more; the remaining 140 to 200 million have come from gifts and private sources.

In analyzing the budget of a modern medical school, it is difficult to segregate the actual costs of educating medical students from the costs of conducting medical research and from the costs of providing the patients in the teaching hospitals with 24 hour medical care, but the fact is plain that a minimum operating budget of from \$450,000 to \$650,000 is required each year to maintain the average present day medical school.

The accumulated annual operating budget of the 71 four year medical schools and 7 two year schools has been

estimated at \$51,000,000. Of this sum, only \$12,800,000 is forthcoming in the form of tuition. State aid provides about \$17,500,000 annually, endowment income about \$7,000,000 and other sources of private income, about \$13,700,000. It has been estimated that to bring all medical schools up to such a generally approved standard as providing at least one full time senior instructor for every 25 students in each of the essential preclinical departments, would call for additional funds totaling \$15,000,000 per year. To provide for the Junior class adequate inpatient clinical clerkship supervision and the eight necessary teaching beds for each member of the class, and for the Senior class adequate outpatient clinical clerkship supervision, and the three new cases per day needed for every member of the class, would require new construction estimated at from 200 to 260 million dollars.

These figures are concerned only with establishing high standards of instruction for the present medical student body of 22-23,000. The cost of establishment of new four year medical schools with entering classes of 100 can be roughly set at from 12 to 15 million dollars (four to five million for the classrooms, laboratories and animal quarters; eight to ten million for the teaching hospital and outpatient department.)

Where are the medical colleges to look for the additional financial aid so badly needed? The average present tuition fee is \$513.00 per year; this figure might be raised as high as \$800.00 per year but this would be done at the risk of establishing a selective process for entering students which would be based more on family financial resources than on intellectual qualifications. State legislatures can legitimately be expected to continue their interest in medical education but new foundations will have to replace older foundations as major sources of funds.

To what extent is it wise to look to the Federal Government for financial support? Under the terms of the Con-

stitution, responsibility for health and for educational measures lies primarily with the States and only such authority as the States delegate falls to the Federal Government in these matters. All experience attests the wishes of supporting local services as far as possible by local taxation. The trend away from this principle is shown in the following figures recently presented to Congress: In 1932, of the more than 8 billion dollars collected in taxes, 54.8% came from local taxes, 23.2% from State taxes, and 22.0% from Federal taxes; in 1948, of the nearly 51 billion dollars collected in taxes, 12.7% came from local taxes, 13.3% from State taxes and 74.0% from Federal taxes. The question can, of course, be raised as to whether a medical school in a State is producing doctors for that State or for the United States as a whole. A number of states are too sparsely populated to justify a medical school within their borders or to provide an adequate teaching hospital even though a medical school were provided. Such states may well be encouraged to unite with neighboring states in establishing regional medical schools. In general, however, in spite of the 24 millions in Federal aid already made available to medical schools each year in the form of research grants and teaching grants, and in spite of the present crop of bills designed to commit the Federal Government to broaden its support of medical education, it would seem wise to encourage return to the traditional tax pattern and to continue to look to private donors and state and local legislative bodies as chief contributors to medical education. (D. F. S.)

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### Our Need for Doctors

On April 15, 1949, 292,516 physicians were registered in Continental U. S. With the population estimated at 147,000,000, this gives one doctor to every 725 persons.

In attempting to decide whether one doctor to every 725 persons is sufficient, many questions must be answered.

#### 1. What is the doctor-population in other countries?

Great Britain has one doctor to 810 persons; Denmark 1 to 950; Canada 1 to 970; Switzerland, Sweden, Norway, Australia and the Netherlands 1 to 1100; France 1 to 1300; Finland 1 to 2200. The only country in the world with a more generous doctor-population ratio is Jewish Palestine where, largely as the result of the influx of displaced physicians, the ratio is one doctor per 260 persons.

#### 2. How does the doctor-population ratio in this country compare today with that in previous years?

1850—1 doctor to 572
1860—1 doctor to 570
1870—1 doctor to 618
1880—1 doctor to 585
1890—1 doctor to 601
1900—1 doctor to 576
1910—1 doctor to 609
1920—1 doctor to 729
1930—1 doctor to 798

Since World War I, the population has increased 27%; the number of physicians has increased 26%.

#### 3. How many persons can a doctor be safely responsible for today as compared with the situation in 1850?

Factors decreasing the number of hours of a doctor's time needed per person include: great reduction in number of cases of communicable disease such as typhoid, diphtheria, tuberculosis, whooping cough; increased availability and utilization of hospitals for childbirth and for illness requiring bed care; greater use of laboratory tests, and ancillary personnel; shorter course of many illnesses due to effectiveness of new antibiotics and chemotherapeutic agents; use of the telephone as a substitute for a physician's visit; faster transportation for physicians as the result of modern automobiles, improved roads and modern snow removal programs. Factors tending to increase the number of hours of doctor's time needed per person include: the increasing number of persons 60 years old and over;

increasing demand for periodic health examinations to find remediable conditions early; the development of effective, though time consuming, specialty treatments such as operative procedures, irradiation and psychoanalysis.

4. What part of his annual income is the average person willing to expend for medical care?

Dr. Frank Dickinson has shown that the consumer is now expending about 3.3% of his income dollar for medical services, less than a third of this for physicians' services. Would he be willing to spend more for increased services?

In 1932, the consumer was spending 1.4% of his adjusted personal income for physicians' services and another 3% for other items of medical care. When, however, we afforded one doctor to every 570 of our population, the average doctor was devoting only 2 years after high school to his medical training; today the average doctor is spending from 8 to 12 years.

5. Would it be safe to use the doctor-population ratio in twelve most prosperous and thickly populated states as a yardstick in estimating national needs?

The answer is obviously "no," in spite of the fact that Administrator Oscar Ewing used this figure as the basis of his estimate as to medical manpower needs in his recent report to the President, "The Nation's Health—A Ten-Year Program." Such an estimate is economically almost as unsound as would be an estimate of housing needs for the country based on what was available per family in a favored suburb of a large city.

The United States is in a period of great economic prosperity with a government committed to a policy of preventing a major depression regardless of cost. In spite of the most staggering national debt in all history, it appears likely that the individual consumer will continue to have the means to command increasing amounts of medical care. The demand for personnel to man public health departments, for psychiatrists to

staff mental hospitals, and for rural practitioners to care for the agricultural population is real and insistent. The 7 two-year medical schools and 73 four-year medical schools are admitting about 6,400 students a year and graduating about 5,400 physicians. Every existing medical school is taking as large an entering class as it can accommodate; in one school, the demonstration desk has been removed and replaced by wheeled tables to make a place for four more student work benches. Admission committees are making every effort to refine their methods of selection with the hope of reducing the 15 to 20% attrition now being experienced. Since 1941, two completely new medical schools have been built, 3 two-year schools have expanded to four year schools and 1 four year school has been completely rehabilitated. At least three states are seriously considering the establishment of medical schools, and several of the two year schools are planning expansion to four year schools. The limiting factors are in order of importance, the supply of instructing staff of senior grade, teaching beds and laboratory facilities.

There is little doubt that there is a real consumer demand for more doctors, particularly in the fields of public health, psychiatry and rural practice. Medical school administrators and state legislators are taking steps to increase the output of physicians as rapidly as that can be done without decreasing standards or diluting quality. The medical schools, however, find themselves faced with the double difficulty of increasing costs and decreasing income. Tuition rates are about as high as they can be raised without the danger of eliminating some of the most promising students on the basis of costs alone. A new medical school involves the expenditure of from 3 to 5 million dollars for the school building and laboratories; from 8 to 10 million for the teaching hospital—an annual operating budget of from \$350,000 to \$500,000. An increase in medical graduates we must and will have but it will likely be in increments of 100 or



200, not in increments of 1,000 or 2,000.

In the meantime, the public should be appraised of the facts that more doctors are to be produced, but that it must, of necessity, be a somewhat slow process if quality is to be safeguarded. The reasons why rapid expansion methods applicable to arts colleges are totally inapplicable to medical colleges should be made plain. And, finally, the financial plight of the medical schools should be made known and private gifts and public grants invited. (D. F. S.)

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### Approved Internships

The Journal of the American Medical Association, May 14, published complete data on approved internships. A few of the points brought out may well be stressed here. The number of hospitals approved for internships remains at 807—37 of that number being under federal control, 118 government hospitals other than federal, 15 proprietary, 305 church sponsored and 332 organized on a non-profit basis. Further: 209 hospitals are affiliated with medical schools as a major or minor teaching unit; 598 have organized their programs independently.

The 807 approved hospitals offer a total of 9,124 internships, 500 of these being offered by the federal services: Navy, 189; Army, 157; Public Health Service, 124, and the other Federal Security Agency hospitals, 30. The number of hospitals approved for intern training has increased by 10 per cent during the past ten years, while the number of internships offered has risen by 16.4 per cent during the same period. The number of medical school graduates has not increased proportionately, with the result that approximately 20 per cent of internships offered have remained vacant. The teaching hospitals, with 4,325 positions available, reported that 365 were not filled. The nonteaching group reported 1,446 vacancies.

Of the 807 approved hospitals, 184 teaching and 547 nonteaching offered training of one year's duration. Less

than 10 per cent have in effect programs of more than 12 months' duration, with 33 teaching and 38 nonteaching hospitals offering an internship in excess of one year. The number of interns serving in approved hospitals exceeded the number of 1948 graduates by 1,525, hence it is evident that a significant number of interns are accepting appointments for a second year of training.

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### Medical Reserve Officers Training Corps (ROTC), U. S. Army

The first medical ROTC unit was established on November 20, 1920, at Washington University School of Medicine in St. Louis. The second unit was established December 13, 1920, at Rush Medical College of the University of Chicago. Other units were established up to the latter part of 1922. Two ROTC students graduated from the Washington University School of Medicine in 1922 and thus became the first medical reserve officers of the program.

In 1942, when the medical ROTC program was suspended in favor of the Army Specialized Training Program, twenty-three medical units were in operation. In the fall of 1946, these units were re-established and the postwar ROTC program began. Twenty additional units were established in 1947, seven in 1948. Thus, fifty units are now in operation in the medical schools of the following institutions: University of Arkansas, University of California, University of Colorado, Yale University, Georgetown University, George Washington University, University of Georgia, Emory University, Loyola University, University of Chicago, University of Illinois, Indiana University, State University of Iowa, University of Kansas, University of Louisville, Tulane University, Johns Hopkins University, Boston University, Harvard University, Tufts College, University of Michigan, Wayne University, University of Minnesota, St. Louis University, Washington University, University of Nebraska, University of Buffalo, Columbia Uni-



versity, Cornell University, New York Medical College, New York University, Syracuse University, Duke University, University of Cincinnati, Western Reserve University, Ohio State University, University of Oklahoma, University of Oregon, Jefferson Medical College, Temple University, University of Pennsylvania, University of Pittsburgh, Vanderbilt University, University of Texas, Baylor University, University of Vermont, University of Virginia, Medical College of Virginia, University of Wisconsin, and University of Washington.

The enrollment average per unit in 1946 was 21 students; in 1947, with forty-three units in operation, the average enrollment was 43 students; the fifty units currently in operation average an enrollment of 48. In 1946, the total medical ROTC enrollment represented 2 per cent of the total medical school enrollment in the United States; in 1947, the ROTC enrollment represented 6 per cent of the medical school enrollment; in 1948, the ROTC increased to 11 per cent of the total student body enrolled. The overall ROTC program is thus improving with each year of operation. However, a study reveals that this is not the case in respect to the enrollment of the individual units. The Department of the Army has discontinued two units because of their inability to reach the minimum legal total enrollment standard of fifty students. All remaining units will be surveyed annually for uneconomical enrollments.

Many reasons are propounded for the failure of units to gain the required minimum enrollment. Foremost is the preponderance of veterans in the medical student body. Veteran students receive credit toward the basic ROTC course commensurate with the amount of honorable active service in World War II. Since the percentage of veterans is beginning to decrease, it is believed that this problem will eliminate itself.

The veteran students' reaction to refresher military training has presented a problem with which the Medical De-

partment has been confronted since the establishment of the postwar program. Heretofore the medical ROTC student has attended a military type of camp at the Medical Field Service School, Fort Sam Houston, Texas. The preponderance of veterans has led to the conclusion that applicatory training in our teaching hospitals will greatly enhance the desire among this group for a medical career in the Army. For this reason, Medical ROTC students who are veterans of one year or more of active honorable service in World War II will be sent to selected Army General Hospitals for their summer camp training. During this period, they will receive orientation in medico-military affairs. But the major share of their time will be spent as clinical clerks under supervision on the wards of the hospital. They will also attend as many of the regularly scheduled formal teaching exercises as can be integrated appropriately into their program.

Non-veteran students and veterans with less than one year of service will be sent to the regular camp at the Medical Field Service School.—Major Willard E. Thompson, M.S.C., U. S. Army.

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#### **Hahnemann Medical College**

At a recent meeting of the Executive Council, it was voted, on the basis of an inspection, that a recommendation be made to the Association, when assembled in executive session in November, that the college be removed from probation.

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#### **More Prescription Writing**

In his presidential address delivered at the annual meeting of the American Pharmaceutical Association held in 1948, President Sylvester H. Dretzka emphasized the need for more teaching of prescription writing in medical schools.

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#### **Dr. Mayo Soley**

June 21, Dr. Mayo Soley, dean of the State University of Iowa College of Medicine, died of a gunshot wound.

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## College News

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### University of Texas Medical Branch

The annual lectureship sponsored by Alpha Omega Alpha, honorary medical fraternity, at the Medical Branch, was given by Arne Tiselius, Ph.D., professor of biochemistry at the University of Uppsala, and Nobelate for 1948. Professor Tiselius discussed the application of chromatographic methods to clinical problems.

The Commercial Solvents Corporation made a grant of \$3,500 for the support of studies on inositol in metabolism, under the direction of Wendell H. Griffith, Ph.D., professor and chairman of the department of biochemistry and nutrition.

Dr. K. F. Meyer, director of the Hooper Foundation for Medical Research of the University of California, gave a series of seminar discussions on virus diseases.

The Arnold Surman Memorial Lecture was given by Dr. J. P. Sanders of Shreveport, Louisiana, vice-president of the American Academy of General Practice. Dr. Sanders discussed the future of American general practice. The Arnold Surman Memorial Lectureship is maintained by the Galveston Chapter of the Phi Beta Pi Medical Fraternity in honor of the late Arnold Surman, a senior medical student who was killed in an airplane accident in 1944.

Dr. I. Costero, professor of physiology in the University of Mexico and director of the Pathology Laboratory of the Cardiology Institute, Mexico City, is giving a series of seminars and lectures. He is working in the Tissue Culture Laboratory.

Dr. H. L. Stewart of the National Cancer Institute, delivered a lecture on various chemical factors associated in carcinogenesis.

The Sealy and Smith Foundation for the John Sealy Hospital, Galveston, has re-established the John Sealy Memorial

Research Laboratory in association with the hospital. This laboratory was originally developed by the late Meyer Bodansky, and closed at his death in 1941. The laboratory is designed to investigate the application of current biochemical and physiological knowledge to the management of disease in particular individual patients. It will be under the direction of Dr. Raymond Gregory, professor of internal medicine.

Dr. Clarence S. Livingood, professor of dermatology and syphilology at Jefferson Medical College, has accepted appointment as professor of dermatology and syphilology and chairman of the department.

Dr. E. E. Baird, professor of clinical pathology at the University of Colorado Medical School, has accepted appointment as professor of clinical pathology.

Dr. Dominic Brachett, director of the Cancer Institute of the University of Buenos Aires, is spending two weeks at the Medical Branch to work with Dr. W. W. Nowinski, director of the Neuro-Chemistry Laboratory, on enzyme factors in tissue growth.

A feature of the 57th Graduation Exercises of the Medical Branch, June 10th, was the unveiling of a bronze head of Ashbel Smith, M.D. (1805-1886), surgeon general of the Republic of Texas, and first chairman of the Board of Regents of the University of Texas. Dr. Smith received his M.D. degree from Yale in 1825, and studied in Paris. He rendered heroic service in the yellow fever epidemic in Galveston in 1839. He established the first hospital in Houston during the war for independence. He was the first Minister of the Republic of Texas to England and France, and was a leading statesman in the Republic. During the Civil War Dr. Smith raised the Second Texas Infantry and commanded it as Colonel.

He was a member of the State Legislature and arranged for the establishment of the University of Texas. He served as dean of Texas Medical College in Galveston before the establishment of the Medical Branch.

Dr. J. C. Rude, director of radiology at the Veterans Administration Hospital, Will Rogers Field, Oklahoma City, Oklahoma, has accepted appointment as professor of radiology. Dr. Rude will have charge of the radiology service of the hospitals of the Medical Branch.

Lewis B. Rockland, Ph.D., of the University of California at Los Angeles, was a special lecturer at the Medical Branch in June. He described new studies on the utilization of protein and amino acid.

The M. D. Anderson Foundation, Houston, has made a grant of \$3,000 to the Medical Branch to support special studies under the direction of Howard Swann, Ph.D., in the physiology laboratory on intrarenal pressure.

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#### Stanford University School of Medicine

Retired: Dr. George D. Barnett, professor of medicine; Dr. Charles H. Danforth, professor and executive department of anatomy; Dr. James R. Dillon, clinical professor and chief of the division of urology; Dr. Harold K. Faber, professor and executive of the department of pediatrics; Dr. Frank W. Weymouth, professor and executive department of physiology.

Resigned: Dr. Charles E. Smith, professor and executive of the department of public health and preventive medicine, has resigned, effective September 1, 1949. Dr. Smith has accepted an appointment in the Graduate School of Public Health at the University of California in Berkeley.

New Appointments: Dr. John A. Anderson, professor and executive of the department of pediatrics. Dr. Anderson has been professor of pediatrics and executive of that department at the

University of Utah for the past five years. Dr. Henry Weyrauch, clinical professor and chief of the division of urology. Dr. Weyrauch has been a member of the faculty of the University of California School of Medicine since 1937. Dr. H. Corwin Hinshaw, associate professor of medicine at the Mayo Foundation, Rochester, became clinical professor of medicine at Stanford University School of Medicine. Dr. Robert H. Alway, associate professor of pediatrics. Dr. Alway has been a member of the faculty of the University of Utah School of Medicine for the past four years. Dr. Lyman M. Stowe, now at Yale School of Medicine as assistant professor of obstetrics and gynecology.

Promotions: Dr. J. K. Lewis, to professor of medicine and will succeed Dr. George D. Barnett on the Stanford service at the San Francisco Hospital. Dr. William W. Greulich will succeed Dr. Charles H. Danforth as executive of the department of medicine. Dr. Rodney R. Beard, to professor of public health and preventive medicine, and will succeed Dr. Charles E. Smith as executive of that department. Dr. Jefferson Crismon, associate professor of physiology, to acting executive of the department of physiology.

Dr. Hadley Kirkman and Dr. Donald James Gray to professor of anatomy; Dr. Robert S. Turner to associate professor of anatomy. Dr. Donald E. King, to professor of bone and joint surgery. Dr. Robert H. Dreisbach, to associate professor of pharmacology. Dr. Robert S. Evans, to associate professor of medicine in charge of clinical pathology.

A cardiovascular research laboratory will be established with funds received from the Bothin Fund and interested philanthropists in San Francisco. It will be used for diagnosis of congenital heart disease and to develop and perfect new techniques which reach directly into the heart's inner chambers by catheterization.

Installation of six new major pieces of X-ray equipment and complete re-

modeling of the department of radiology in the Stanford University Hospital and Medical School was made recently. Total cost of the new equipment and the remodeling work exceeds \$100,000 and will give the hospital one of the most modern radiology departments on the West Coast.

Dr. Henry S. Kaplan, professor of radiology, who is director of the Radiology Department in the medical school and hospital, has also established an experimental radiology laboratory in the Ruth Lucie Stern Research Building on Clay Street, opposite the hospital. Experimental cancer research, supported by funds from the U. S. Public Health Service National Cancer Institute, is being carried on by members of the radiology staff in this laboratory. Now in progress are studies on experimentally induced leukemia (blood cancer) in mice.

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#### **Bowman Gray School of Medicine**

Dr. Frederick A. Blount, graduate of the University of Pennsylvania School of Medicine, has been appointed assistant in clinical pediatrics. Dr. Angus Crawford Randolph, graduate of the medical school of the University of Virginia, has been appointed instructor in clinical psychiatry.

Postdoctoral fellowships granted by the Atomic Energy Commission have been renewed for another year to Dr. Kingsley M. Stevens and Dr. Jerry Aikawa, both of whom are doing research with radioisotopes in the department of medicine. Dr. Stevens is studying the synthesis of protein by bacteria, and Dr. Aikawa's research is concerned with the alteration in the distribution of body fluids in infectious diseases.

Work is now being completed on the school's new isotope laboratory to cost approximately \$13,000, not including equipment to be paid for out of a grant made to the department of medicine.

The school has recently received grants totaling \$51,802. All are from the U. S. Public Health Service with

the exception of one from the Markle Foundation. A grant of \$25,000 to the department of physiology and pharmacology will be used for further study and experimentation on the usefulness of various new drugs in the treatment of peripheral vascular disease and other circulatory disturbances.

A grant of \$4,320 to the internal medicine department is for further study in "Alterations of Permeability of Membranes in Infectious Diseases." The department of medicine also received a grant of \$5,929 for research in "Factors Concerned in Reaction to Chemotherapy" and shares with the department of biochemistry a grant of \$5,940 for research on liver disease using radioisotopes. Dr. R. V. Postlethwait of the department of surgery received a grant of \$3,613 for further study in "Wound Healing." The Markle grant of \$7,000 to the department of medicine is for continued study in the "Alteration in Body Functions Caused by Spotted Fever and Typhus" and in "Factors Possibly Producing Positive Trichilla Skin Tests in the Absence of Infection."

Dr. Robert B. Lawson, associate professor of pediatrics, and Dr. J. Maxwell Little, professor of pharmacology, have received a grant of \$15,955 from the National Foundation for Infantile Paralysis for continuation and extension of studies attempting to establish improved techniques for growing poliomyelitis virus.

Dr. Robert L. McMillan, associate professor of clinical medicine, was elected president of the North Carolina Heart Association in an organizational meeting of the association held at Pinehurst in connection with the annual meeting of the N. C. Medical Society. Dr. George T. Harrell, Jr., head of the department of internal medicine, was named secretary. The group will sponsor a symposium on heart disease for doctors and laymen at Bowman Gray School in the Fall.

Dr. Harold D. Green, head of the department of physiology and pharma-

cology, was delegate-at-large from Region 3 to meetings of the Assembly of the American Heart Association in Atlantic City, N. J., June 2 to 5. Fifty-six students have been chosen to make up the freshman class entering in September. The class was selected from a total of 1,250 applicants with a majority of them coming from Wake Forest College.

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#### Northwestern University Medical School

The appointment of Dr. Richard H. Young as dean of the Northwestern University Medical School was announced by Pres. Franklyn B. Snyder.

Dr. Young, now dean of the College of Medicine of the University of Utah, will assume his duties at Northwestern some time next summer. He will succeed Dr. J. Roscoe Miller, present dean of the Northwestern University Medical School, who becomes the university's next president in July.

The deanship will not be Dr. Young's first faculty appointment at Northwestern, because he was a member of the department of medicine from 1931 to 1945, serving as head of the experimental medicine division the last seven years of that period. In 1945, he became director of the student health service of the university, and served in that capacity for a year, immediately prior to his appointment as dean at Utah in the fall of 1946.

Dr. Loyal Davis, professor of surgery and chairman of the department in the Northwestern University Medical School, and chief of staff of Passavant Memorial Hospital, has been appointed the first Grunow Professor of Surgery. The chair in surgery was established last February with a gift from the Lois Grunow Memorial Clinic, Inc., of Phoenix, Ariz.

Dr. Tom D. Spies, professor of nutrition and metabolism and chairman of the department, received the annual Charles V. Chapin Memorial Award at

the annual meeting of the Rhode Island Medical Society.

A radioisotope unit which is constituted for instruction, research and therapy has been established. Equipment for the unit's laboratories is being financed with a grant in excess of \$27,000 from the Atomic Energy Commission through the Office of Naval Research. In addition to providing instruments and other facilities for research involving the use of radioisotopes, the medical school will introduce several new courses into its undergraduate curriculum, and it has formulated a proposed program of postgraduate medical instruction in the utilization of radioactive elements. The third phase of the unit's operations, that of patient therapy, will involve the university's four affiliated hospitals, Wesley Memorial, Passavant Memorial, Evanston, and Children's Memorial, and one of its cooperating institutions, St. Luke's Hospital. For all three operations, the Atomic Energy Commission will supply the radioactive materials from Oak Ridge, Tenn. Radioactive elements will also be made available to the medical school's Montgomery Ward Clinics. Supervised by John A. D. Cooper, Ph.D., assistant professor of chemistry, the laboratory is situated in the Montgomery Ward Building in the university's medical center on the Chicago campus. Personnel of the radioisotope unit is made up of seven men on the faculty of the medical school. Unit chairman is Dr. Howard L. Alt, associate professor of medicine. Others are Dr. Earl E. Barth, Dr. Cooper, Chester J. Farmer, M.A., Dr. Smith Freeman, Dr. George V. LeRoy and Dr. Ray S. Snider. Drs. Alt, Barth, Cooper and Freeman and Mr. Farmer are participating institution members of the Argonne Laboratory. Dr. Snider is consultant to the biologic division at Argonne.

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#### Hahnemann Medical College

New Appointments: Raymond C. Truex, Ph.D. (Columbia University), professor of anatomy and head of divi-

sion; Eleanor H. Yeakel, Ph.D., assistant professor of histology and embryology; M. John Boyd, Ph.D., professor of biochemistry and head of division; Joseph S. DeFrates, Ph.D., associate professor of biochemistry; Floyd J. Wiercinski, Ph.D., assistant professor of physiology; Franklin K. Fite, M.D., assistant professor of pathology; Charles L. Brown, M.D., dean, professor and head of the division of medicine; Donald R. Fitch, M.D., director of educational program for seniors in outpatient department; H. Earle Twining, M.D., professor and head of the department of dermatology and syphilology; Daniel F. Downing, M.D., assistant professor of pediatrics.

The department of public health and preventive medicine has been given full status with a staff of eight. Dr. D. F. Lucchesi is professor and head of the department; Dr. A. M. Perri, associate professor; Dr. A. S. Bogucki, assistant professor. Lecturers, associates and a demonstrator complete the teaching staff.

Dr. Charles E. Price, formerly director Montgomery Hospital, Norristown, Pa., has been appointed medical director of Hahnemann Hospital.

Retired: Wm. A. Pierson, now professor emeritus division of biochemistry; G. Harlan Wells, M.D., now professor emeritus division of medicine; Thomas W. Phillips, M.D., professor emeritus division of anatomy.

Gifts: William Goldmann Dean's Fund, \$50,000; the Walter E. Hering Foundation, \$10,000 for college improvements; \$5,000 for fellowship in medicine; \$2,000 for teachers' salaries in pathology; \$10,000 for new equipment in college. Constantine Hering Fund: \$10,000 for new equipment in college; \$2,400 for research in pathology. U. S. Public Health Service: \$20,500 for cancer research; \$37,500 for psychiatry research and teaching (for 3 years). Life Insurance Medical Research Fund: \$4,200 for study of effect of genetic background on production of rabbit hypersensitivity. M and R Die-

tetic Laboratories, Inc.: \$2,750 for pediatric endocrine research. Commercial Solvents Corporation: \$5,000 for study of inositol. American Foundation for High Blood Pressure: \$1,000 for study of electrical properties of chemicals or drugs that affect blood pressure. The Research Corporation: \$1,000 for study of electrical action of drugs. Alumni Association of Hahnemann: \$47,246.31 for salaries of full time teachers.

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#### New York University- Bellevue Medical Center

Dr. Robert Boggs has been appointed dean of the New York University Post-Graduate Medical School, New York University - Bellevue Medical Center. Dr. Boggs will administer the expanded program of postgraduate medical education made possible by the recent grant of more than eight million dollars to the Medical Center by the Samuel H. Kress Foundation. Dr. Boggs came to New York University after five years in the U. S. Navy, serving in the Pacific as medical officer of the U. S. S. Wichita, and at Columbia University and the St. Albans Naval Hospital. A graduate of the University of Oregon and McGill University, Dr. Boggs was a research Fellow in Surgery at the Harvard Medical School and the Peter Bent Brigham Hospital of Boston and was on the house staff of the New York Hospital.

Dr. S. Bernard Wortis, professor of psychiatry and chairman of the department in New York University College of Medicine, has been given the additional title of professor of psychiatry and neurology in the university's new postgraduate school of medicine. He has relinquished administrative responsibility as director of the Bellevue Psychiatric Division, and on January 1 became consultant in psychiatry and neurology to the division. Dr. Lewis I. Sharp, associate professor of clinical psychiatry, has become director of the Bellevue Psychiatric Division. Dr. Morris Herrman, associate professor of psy-



chiatry, has relinquished his position as assistant director of the Bellevue Psychiatric Division in order to do full time psychiatric teaching and research in the postgraduate and undergraduate colleges of medicine. He will be visiting psychiatrist and neurologist to the Bellevue Psychiatric Division.

Beginning with the academic year 1949-1950, the New York University College of Medicine will increase its tuition fee from \$650 to \$750.

Actual demolition ceremonies signaling the start of construction of the \$32,744,000 building and development program of the New York University-Bellevue Medical Center were held recently. This will eventually become one of the world's greatest centers of medical and health facilities, which with its related facilities will cover more than 40 acres. The ceremonies climaxed four years of preparation, during which time individuals, business firms and philanthropic foundations contributed more than \$20,000,000 toward the construction of the University section, its initial unit.

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#### **Stritch School of Medicine of Loyola University**

The affiliation of Loretto Hospital with Loyola was announced. The affiliation with the twenty-five year old hospital is the second important step in the formation of the new Loyola University Hospital Group. Last fall the University Hospital, 432 South Wolcott Avenue, was made available to the school as a teaching and research unit. The new medical director of the hospital is Dr. George Rukstinat, well known pathologist. Dr. Samuel G. Plice is chairman of the division of medicine, and Dr. L. F. Plzak will serve as director of surgery.

A new 29 bed psychiatric unit, one of the first in a private hospital in Chicago, was established in 1947; this division is headed by Dr. John J. Madden, professor and chairman of the department of neuropsychiatry at the medical

school. The division of obstetrics and gynecology will be under the direction of Dr. George Z. Wickster. New nominees to the medical staff of the hospital will be selected from members of the faculty of the Stritch School of Medicine. A general practice division of the hospital staff will be maintained and will be unique in that these patients, as well as those admitted for specialized conditions, will be specially studied and incorporated in the teaching program.

A coordinated research program will be carried on and will be under the joint auspices of Loretto and Loyola. To assist in highly technical and research phases of the program, Loyola will supply consultants in fields such as bacteriology, biochemistry, pharmacology, physiology and anatomy.

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#### **University of Cincinnati College of Medicine**

The university announces the creation of a Texaco Fellowship in Industrial Medicine, through a grant made to the Institute of Industrial Health in the Graduate School of Arts and Sciences by The Texas Company. This fellowship is being established in connection with the training of physicians for practice in industrial medicine and hygiene. The Texaco Fellowship will be awarded for a two year period, to begin July 1, 1949, and will provide for the intramural period of training of the successful candidate. On the completion of the work of the fellowship within the university, an additional year will be spent in supervised practice in one or more industrial organizations. On successful completion of the entire course of training the degree of Doctor of Industrial Medicine will be awarded by the university.

Candidates who are interested in this opportunity for training in the field of industrial medicine should write directly to Dr. Robert A. Kehoe at the University of Cincinnati.

For performing the outstanding work



of the year in the field of industrial medicine, Dr. Robert A. Kehoe, professor of industrial medicine, received the Knudsen Award of the American Association of Industrial Physicians and Surgeons. Dr. Kehoe, a member of the faculty since 1919, is head of the department of preventive medicine and industrial health, director of the Kettering Laboratory of Applied Physiology and Institute of Industrial Health of the university. The Knudsen Award was established in 1938 through the late General William Knudsen of the General Motors Corporation.

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#### University of Chicago

On May 3, 1949, the anniversary of the death of Dr. Howard Taylor Ricketts, the university announced the granting of the Howard Taylor Ricketts Award to Dr. Ludvig Hektoen and Dr. Russell M. Wilder. Dr. Hektoen is professor emeritus of pathology, and Dr. Wilder, formerly chairman of the department of medicine, is now head of the department of medicine, Mayo Foundation. Medals were presented to the two recipients of the award on May 23, 1949, at exercises held at the University of Chicago Clinics. Dr. Wilder delivered an address entitled "The Rickettsial Diseases: Discovery and Conquest."

The cornerstone for the seven story Nathan Goldblatt Memorial Hospital was laid May 17. The \$2,500,000 cancer research hospital was established in 1946 with a gift of \$1,000,000 to the university by the Goldblatt Brothers Foundation in memory of Nathan Goldblatt, who died of cancer in 1944. Dr. Leonard Scheele, Surgeon General, U. S. Public Health Service, spoke for the foundation trustee, the women's board and the Nathan Goldblatt Society for Cancer Research, and delivered the principal address at the cornerstone ceremony. Other speakers included President Ernest C. Colwell, Dr. Lowell T. Coggeshall, dean of the division of biological sciences, Maurice Goldblatt,

Gov. Adlai Stevenson and Mayor Martin H. Kennelly. This will be the first university hospital in the country with the entire staff engaged full time in cancer research and treatment. A second cancer hospital, the Argonne Cancer Research Hospital, to be built by the United States Atomic Energy Commission adjacent to the Goldblatt hospital, will also be devoted to full time research treatment of cancer patients with radioactive isotopes.

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#### Georgetown University School of Medicine

Hachmeister, Inc., of Pittsburgh, has established the A. C. Hachmeister Lectureship in the department of pharmacology in memory of its founder and first president, Mr. A. C. Hachmeister. The lecture is to be given every year.

Dr. C. Heymans, professor of pharmacology at the University of Ghent, and Nobel Prize Laureate in Medicine, 1938, was selected as the first A. C. Hachmeister Memorial lecturer, and delivered his lecture May 4, 1949, at Gaston Hall, Georgetown University, on the subject "The role of pressor and chemo-receptors in the regulation of respiration."

Dr. Isadore Levin has been appointed associate professor of medicine, in charge of the department of physical medicine. Dr. Levin was in the United States Public Health Service from 1931 through 1933.

The effect of man's environment on his chance of getting cancer will be studied as a new \$60,000 project under the direction of scientists of the National Cancer Institute. Dr. Wilhelm Hueper, an institute scientist, will direct the project.

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#### University of Oklahoma School of Medicine

On June 20, 1949, the first group of senior medical students began work under the preceptorship program of the medical school. This program is de-

signed to offer the senior medical student an opportunity to observe general medical practice in smaller communities in Oklahoma and, it is hoped, will encourage him to consider such a location when he enters practice.

Each student will spend a period of 11 weeks in one of 18 towns in Oklahoma. He will be under the supervision of a physician and will observe and receive instruction in all phases of medical practice including office and home calls and hospital practice. The program will extend the senior year to 44 weeks instead of the present 32 weeks. The supervising physician is called a preceptor and is a member of the general faculty of the school. Appointments will be made by the Board of Regents of the university and will be for one year.

Dr. H. W. Haggard, assistant to the president of Yale University, lectured on "Some Aspects of Alcoholism" recently. Dr. Arthur P. Stout, associate professor of surgery, Columbia University College of Physicians and Surgeons, recently delivered two lectures on carcinoma of the stomach and carcinoma of the breast.

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#### **Duke University Medical School**

A grant of \$100,000 has just been received for research in physical biochemistry from the Rockefeller Foundation. The grant will support protein research for a seven year period under the direction of Dr. Hans Neurath, professor of physical biochemistry. The funds provided are in addition to a grant of \$25,000 awarded in 1946 for a five year period.

Duke is one of the few institutions in this country which has a physical biochemistry division. It was organized by Dr. Neurath in 1939 under the direction of Dr. W. A. Perlzweig, chairman of the biochemistry department.

Associated with Dr. Neurath are Dr. George Schwert, assistant professor, who was awarded the Markle Foundation Scholarship in Medical Science last

March, and Dr. W. F. H. M. Mommaerts, recent recipient of a senior fellowship by the American Heart Association.

Several postdoctorate and predoctorate fellows of the U. S. Public Health Service and graduate students in biochemistry are also on the staff.

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#### **Long Island College of Medicine**

Two graduates of the college, Dr. John J. O'Connor and Dr. Chas. M. Plotz, have been awarded scholarships by the New York Academy of Medicine, under the Bowen-Brooks Memorial Fund to enable them to continue their postgraduate work. The Bowen-Brooks grants-in-aid are made only to young doctors who are graduates of New York City medical schools, and who have served or are serving on the house staffs of hospitals in the metropolitan area.

The Bowen-Brooks scholarship fund was originally established in 1930 by the late Mrs. Elizabeth Cochran Bowen in memory of her son, Alexander Cochran Bowen, and her physician, Dr. Harlow Brooks, to enable two recipients to pursue two years' postgraduate studies in Europe. During the war, there being no young doctors available, the awards were suspended, and since then, because of the destruction of so many medical schools in Europe, the funds have been awarded as grants-in-aid to a larger number of young doctors to enable them to continue one year's postgraduate work in the United States.

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#### **Western Reserve University School of Medicine**

The appointment of George M. Humphrey, president of the M. A. Hanna Company, to the chairmanship of the Joint Committee for Advancement of Medical Education and Research of Western Reserve University Medical School was announced recently. Humphrey succeeds Lewis B. Williams,

who although resigning as chairman, will continue as a member of the committee.

The committee was formed to promote the conception that the medical school should serve this whole geographical area, and that its ultimate effect should be to help bring about continuing improvement in medical care. It was seen that to accomplish this end the school should be founded on a rock of permanent endowment in order to gain stability and security for its staff and continuity of progress in all its activities for health betterment. Building an adequate endowment is a long-term venture. It is to this effort that Humphrey will give leadership.

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#### University of Pennsylvania School of Medicine

With a gift of \$250,000 for the construction of a new heart clinic at the University of Pennsylvania—the nation's oldest medical school—and an additional \$25,000 to extend an original grant made in 1940 for cancer research, the Penn Mutual Life Insurance Company today threw its financial strength into the fight against heart disease and cancer. The sum of \$250,000 was designated for the building of a Penn Mutual heart clinic in the university's proposed new medical center. The additional sum of \$25,000 extends, for two more years, a grant made in 1940 when Penn Mutual pioneered and was the first corporation in the country to support cancer research at the university. The new clinic, to be known as the Penn Mutual Heart Clinic for the Study and Treatment of Cardiovascular Diseases, will be part of the outpatient building of the Thomas Sovereign Gates Memorial Pavilion.

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#### University of Wisconsin Medical School

Dr. Alexander M. MacKay was named subchairman of the department of anesthesiology.

An intensive study of arthritis and rheumatism will be initiated following a gift of \$10,300 from the Thomas E. Brittingham Trust Fund. Dr. Daniel M. Angevine and Dr. Charles H. Altshuler of the department of pathology, who have been conducting histochemical studies of rheumatic disease for two years, will receive \$5,300 to finance their work. Four thousand dollars will be used for electromyographic apparatus for the study of muscular changes in arthritic conditions. Dr. Charles V. Seastone of the department of microbiology will use \$1,000 of the gift to investigate sensitization reactions to streptococci in rheumatic and arthritic states.

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#### Yale University School of Medicine

Dr. William T. Salter, professor of pharmacology at Yale University, New Haven, Conn., on April 27 received the first Iodine Educational Bureau Award at a meeting of the American Pharmaceutical Association. Dr. Salter was cited for his research on the relation of iodine in the blood to the thyroid gland.

A gift of \$2,000,000 has been received to expand work in psychiatric guidance of students. The gift came from the Old Dominion Foundation, of Washington, D. C. Head of the Foundation is Paul Mellon, a Yale graduate in the Class of 1929.

Yale's present program of psychological and psychiatric assistance and guidance to students is under the supervision of Dr. Clements C. Fry, head of the Division of Psychiatry and Mental Hygiene of the Yale Department of Health. Dr. Fry will be in charge also of the expanded program.

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#### University of Buffalo School of Medicine

A grant of \$29,370 has been made by the Veterans' Administration for a research project on red blood cells in relation to hemorrhagic shock. The

grant was made through the National Research Council. It is for one year and is renewable as the project continues. The research will be headed by Dr. John D. Stewart, professor and chairman of the department of surgery. There will be three major investigators—a hematologist, Dr. Edgar L. Hummel, assistant professor of medicine and assistant in pharmacology; a biophysicist, Dr. Joseph G. Hoffman, research professor of biophysics; and a surgical assistant, Dr. Irving Rudman; plus three technicians.

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#### University of Utah School of Medicine

Dr. Richard H. Young has resigned the deanship. He succeeds Dr. J. Roscoe Miller as dean of Northwestern University Medical School.

Dr. Mark Nickerson, assistant professor of pharmacology, was awarded the 1949 John J. Abel prize in pharmacology by the American Society for Pharmacology and Experimental Therapeutics for his researches on "Pharmacology of the B-haloalkylamines: A new class of adrenergic blocking agents." This prize of \$1,000 and a bronze medal has been donated by the Eli Lilly Co., Indianapolis, for the purpose of stimulating fundamental research in pharmacology and experimental therapeutics by young investigators working in a college, university, hospital, or a non-profit institute.

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#### George Washington University School of Medicine

Dr. Warren Andrew, chairman, department of anatomy, who has been visiting professor of anatomy at Washington University School of Medicine in St. Louis, returned to the university March 15, and will be in charge of the histology class for the remainder of the course.

A grant of \$36,861 to permit studies of the nerve supply of the human lung has been made to the department of

surgery by the Veterans' Administration. The grant will provide funds for studies with particular reference to the surgical treatment of asthma. Studies will be continued over a two year period.

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#### Temple University Medical School

Appointments: Dr. George D. Vaughn, instructor in proctology; Dr. George W. Russell, assistant instructor in psychiatry; Dr. Sydney Ellis, associate professor of pharmacology.

Recent gifts totaling \$1,388 have been made to the Psychiatric Department Research Fund and \$5,100 for research in ophthalmology.

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#### Harvard University Medical School

Dr. George Packer Berry, associate dean and professor of bacteriology in the University of Rochester School of Medicine, has been appointed dean to succeed Dr. C. Sidney Burwell, who will remain as professor of experimental medicine and devote much of his time to research. Dr. Berry will also be professor of bacteriology.

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#### Jefferson Medical College

Dr. William Harvey Perkins, dean, has been appointed by the American Medical Association as one of the five medical educators to represent the association at the congressional committee hearings in Washington on Title I—Education of Health Personnel—of the National Health Insurance and Public Health bill.

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#### University of Virginia School of Medicine

Dr. H. Rowland Pearsall has been promoted to assistant professor of internal medicine and designated Coordinator of the Cancer Program, effective April 1, 1949. Dr. Page Booker has been appointed instructor in pediatrics.

### **Columbia University College of Physicians and Surgeons**

Dr. Willard C. Rappleye, dean, was appointed vice president in charge of medical affairs at Columbia University. General Eisenhower's announcement specified that this position shall be held by the dean of the faculty of medicine. The creation of the new office, among others, resulted from a survey begun nearly two years ago.

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### **University of Pittsburgh School of Medicine**

The university has received a gift of \$300,000 from the Maurice and Laura Falk Foundation to construct a medical library in the proposed new school of medicine. The library will be known as the Maurice and Laura Falk Library, and its initial collection will include more than 50,000 volumes.

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### **Louisiana State University School of Medicine**

Dr. William W. Frye, assistant director, division of graduate medicine, Tulane University of Louisiana School of Medicine, has been appointed dean.

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### **Boston University School of Medicine**

Dr. Walter Jetter, pathologist for the department of mental health and assistant professor of legal medicine at Harvard, has been selected by the trustees of Boston University to head up a new department of legal medicine.

### **University of Louisville School of Medicine**

A research grant of \$4,860 has been awarded the university by the Kentucky Division of the American Cancer Society. This grant, the first ever given by this society to the university, will be used by Edmund K. Hall, D.Sc., associate professor of anatomy, to conduct experiments of animal growth for one year.

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### **University of Minnesota Medical School**

The university will receive a gift of approximately \$500,000 for medical research from the estate of Silas McClure, Minneapolis businessman who died February 16. The university had previously been granted funds by Mr. McClure in memory of his wife, Katherine Esgen McClure.

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### **Southwestern Medical College**

Dr. Carl A. Moyer, professor of experimental surgery, was the 1949 recipient of the Dallas Southern Clinical Society's Marchman Award for research into the fluid balance of the human body.

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### **University of Rochester School of Medicine**

Dr. Joe W. Howland and Dr. J. Newell Stannard have been promoted to associate professor of radiation biology. Dr. S. Lee Crump has been appointed assistant professor of radiation biology.

**FRAUD:** Charles William Sturup, 3912 Joliet Street, New Orleans, applied for admission to Bowman Gray School of Medicine. He offered a transcript from Mississippi College which, on inquiry, was found to be a fraud. When Sturup, who was most anxious to become a missionary physician, learned that he would not be admitted to medical school on his true credentials, secured a blank transcript from Mississippi College and filled it in with favorable credits "as a last hope" to gain admission. He admitted the forgery in writing. **It is important that submitted credentials be checked at the true source.**

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## General News

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### Israeli Medical School

The Hebrew University-Hadassah Medical School, the first medical school to be established in the State of Israel, opened its doors May 17, 1949, as a joint undertaking of the Hebrew University and Hadassah, the Women's Zionist Organization of America.

Until security conditions permit continuation of construction on Mt. Scopus, the site of the present 400 bed Rothschild-Hadassah-University Hospital, the school will be housed in four hospital units, totaling initially over 300 beds, in the city of Jerusalem proper.

The first class of approximately fifty students, drawn from a group of two hundred candidates whose previous training in medicine (ranging from two to seven semesters in European medical schools) was interrupted by Israeli military service in the Holy Land, will receive the following training: One year of instruction in the preclinical medical sciences (exclusive of anatomy and physiology); two years of clinical training; and one year of practical work in hospitals recognized by the faculty. A one year internship in the hospitals in Israel will also be required. Throughout the period of training, emphasis will be placed on preventive and social medicine.

The second class of approximately fifty students to be admitted in April, 1950, will likewise be drawn from qualified candidates, previously trained abroad in medicine, who have served in the Israeli Defense Army.

By 1951 the first regular class will be admitted to the full six year course of instruction, the first two years of which will cover the premedical studies and the last four years the standard American medical course. Plans for the permanent medical school buildings, which will be part of the University City on Mt. Scopus, are already in the blueprint

stage. The Medical School campaign, sponsored by Hadassah and the American Friends of the Hebrew University, is presently engaged in raising the \$5,500,000 needed to complete the school. Almost \$4,000,000 of this sum has already been raised.

In preparation for the opening of the Medical School a number of Hadassah Medical Organization physicians were sent to the United States for a period of one to three years for advanced study, research, observation and participation in clinical and teaching programs at leading American medical colleges, hospitals and health centers. All but one, who is presently completing his work, have returned to Israel to take up their duties with the medical school and university hospitals.

Instruction at the medical school will be given by members of the staff of the Hebrew University and the Rothschild-Hadassah-University Hospital. The personnel of existing departments will be augmented by physicians recently returned from the United States. New departments will be opened as staff and facilities are available. Visiting professors and lecturers from Israel and abroad will be invited to the Medical School as needs arise. One of the first of these visitors is Dr. Samuel Standard, associate professor of clinical surgery at New York University College of Medicine-Bellevue Medical Center, who will inaugurate instruction in surgery at the school.

The degree "Doctor of Medicine" will be conferred on students who have complied with the conditions specified in the curriculum, passed the examinations and submitted a thesis. The four school years of medical instruction are divided into the following main parts: (a) A period of study of the basic medical sciences (one year); (b) A period of clinical training (two years); (c) One



year practical work in hospitals recognized by the faculty. Instruction on Public Health matters will be given throughout the whole period of training.

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#### **Fellowships for Latin-American Physicians**

The American College of Physicians and the W. K. Kellogg Foundation, with the cooperation of the U. S. Department of State and of medical schools in the U. S. A., Canada and Latin-American countries, will shortly inaugurate a program of postgraduate medical fellowships. Outstanding young physicians will be nominated to the College and Foundation by local committees in the countries to the south, and those to whom fellowships are awarded will be brought to this country for a year or more of special training. It is anticipated that the first fellows will begin their studies during the autumn of 1949.

Eligibility requirements include citizenship in the country from which application is made and familiarity with its culture and economy, graduation from an acceptable medical school and completion thereafter of an internship of 12 months or more, ability to use the English language, and assurance of a subsequent teaching affiliation with a medical school in the native country. Those needing some training in English will be assigned to a special course for the purpose in the United States.

Designed to stimulate progress in the teaching of internal medicine and research, and to help the most promising young doctors of medicine in these countries to prepare for teaching and research careers in their native countries, the program also will serve to increase understanding among the American republics by serving as a medium for the exchange of knowledge and acquaintanceships.

The American College of Physicians, operating through its Committee on Fellowships and Awards, will undertake to arrange a suitable program of study in internal medicine or its subspecialties,

such as cardiology, gastroenterology, etc., in widely recognized medical education centers in this country, and to place the fellows appropriately under preceptors in these institutions.

The W. K. Kellogg Foundation will provide each fellow with a monthly stipend adequate for his basic living costs, an allowance for necessary travel within this country or Canada, and will defray the tuition for courses recommended by the preceptor and approved by the sponsors. In view of the pressing need of Latin-American medical libraries, the Foundation will reimburse the fellow for the cost of required textbooks on condition that they become the property of the medical school in which the fellow will teach upon his return home.

Representatives of the Foundation will visit the fellows periodically during their stay in this country for conferences with them and their preceptors, thus to follow their progress. They will also be visited at intervals after their return to their home institutions in an effort to evaluate the end results of their training and to offer any possible assistance to improve teaching, research and practice in the field of internal medicine in their respective countries.

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#### **Bulletin World Federation for Mental Health**

Issue No. 1 of this bulletin, dated February, 1949, has made its appearance. It details the reasons for the existence of this organization, founded in 1948, and publishes reports made by representatives of member associations in various countries. Readers are requested to make suggestions for a name for this publication. Thus far, the name "mens sana" has met with most approval. The fundamental purpose of the organization is to bring about improvement in dealing with all forms of mental ill health and ill health in general. Subscriptions—\$1.00 per year—should be sent to the Editor, World Federation for Mental Health, 19 Manchester Street, London, W. L., England.



### Excerpta Medica

Fifteen journals containing pertinent and reliable abstracts in English of every article in the fields of clinical and experimental medicine from every available medical journal in the world are represented in this publication. It is divided into fifteen sections covering various fields in medicine. Each section is under the direction of a separate international Board of Editors comprising specialists from many countries with two subeditors attached to the Amsterdam office. One volume of each section is completed at the end of the calendar year. An index is included. Subscription prices range from \$15 to \$37.50 per section; \$342.50 for all sections.

The editor-in-chief is Dr. Morris Fishbein, editor of the Journal of the American Medical Association. Headquarters is: Excerpta Medica, 111 Kalverstraat, Amsterdam C., The Netherlands. The Williams & Wilkins Company, Mt. Royal and Guilford Avenues, Baltimore 2, Maryland, are the publishers. This is a nonprofit Foundation and has been accepted by UNESCO as the most comprehensive abstract service available anywhere in the world today.

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### Interns, Psychiatric and Surgical Residents

The United States Civil Service Commission has announced a Medical Officer examination for filling rotating intern, psychiatric resident, and surgical resident positions in St. Elizabeths Hospital, Washington, D. C. The salaries for rotating interns are \$2,200 for the first year and \$2,400 for the second year; the salaries for psychiatric resident range from \$2,400 to \$4,100 a year; and for surgical resident, from \$3,400 to \$4,150.

To qualify, applicants for the rotating intern positions must be third or fourth year students in an approved medical school. Applicants for psychiatric resident and surgical resident positions must be graduates of a medical school with the degree of doctor of medicine, and must have completed a full year in an

approved rotating internship. Applicants for appointment as surgical resident must have completed three full years as residents-in-training in surgery in an approved residency. No written test is required for this examination. The maximum age limit of 35 years is waived for persons entitled to veteran preference.

Further information and application forms may be obtained at most first and second class post offices, from civil service regional offices, or from the U. S. Civil Service Commission, Washington 25, D. C. Applications will be accepted by the Commission's Washington office until further notice.

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### Ohio Rural Medical Scholarships

The Ohio State Medical Association has approved a rural medical scholarship plan "to stimulate interest on the part of rural young men and women in the study of medicine, with the belief that because of their interest in rural life, they will later establish medical practice in rural communities." The scholarships will be administered by the Committee on Rural Health, with the aid of an advisory committee composed of representatives from the various rural and educational organizations. Each grant will be \$500 per school year, awarded for a four year period, subject to acceptable work on the part of the student. No obligations other than that will be attached to the scholarship. It is restricted to Ohio residents but may be used at any approved medical school in the country.

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### University of Puerto Rico School of Medicine

The Insular Legislature has approved a bill to authorize the Superior Board of Education of the University of Puerto Rico to establish a school of medicine, giving the board also jurisdiction over the administration of the School of Tropical Medicine, San Juan, now operating under the guidance of Columbia University.

### Research Fellowships in Medicine

The American College of Physicians announces that a limited number of Fellowships in Medicine will be available from July 1, 1950 to June 30, 1951. These Fellowships are designed to provide an opportunity for research training either in the basic medical sciences or in the application of these sciences to clinical investigation. They are for the benefit of physicians who are in the early stages of their preparation for a teaching and investigative career in Internal Medicine. Assurance must be provided that the applicant will be acceptable in the laboratory or clinic of his choice and that he will be provided with the facilities necessary for the proper pursuit of his work. The stipend will be from \$2,200 to \$3,200.

Application forms will be supplied on request to The American College of Physicians, 4200 Pine Street, Philadelphia 4, Pa., and must be submitted in duplicate not later than October 1, 1949. Announcement of awards will be made November, 1949.

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### Research in Orthopedic Surgery

The Kappa Delta Sorority has made a grant of \$1,000 to the American Academy of Orthopedic Surgeons for the best individual research work in orthopedic surgery and related scientific fields. The Academy Committee on Scientific Investigation will act as the award committee. With the counsel and advice of the Executive Committee of the Academy the winner of the award will be

selected. Presentation of the award will take place at the annual meeting of the academy which will be held in New York, February 11-16, 1950. Dr. Walter G. Stuck, chairman of the Academy Committee, 414 Navarro, San Antonio, Texas, should be contacted for further information.

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### Courses in Infantile Paralysis

During the months of July, August, October and November, courses in the diagnosis and treatment of infantile paralysis will be offered under the sponsorship of the National Foundation for Infantile Paralysis at various centers. Detailed information may be secured by addressing the National Foundation, 120 Broadway, New York 5, N. Y.

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### Markle Fund Grant for Medical Aid

Thirteen medical scientists have been named as the second group of "Scholars in Medical Science" appointed by the John and Mary R. Markle Foundation as part of a five-year program to keep young doctors on teaching and research staffs of medical schools. The sum of \$325,000 has been appropriated for their support, to be allotted in grants of \$25,000 each at the rate of \$5,000 a year to the medical schools in which they now hold faculty appointments. Under the program, begun in 1948, 29 doctors are being supported with total grants of \$725,000. It is estimated that within five years fifty scientists will be aided with grants totaling \$1,250,000.

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## Book News

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**Introduction to Human Anatomy**

By Carl C. Francis, M.D., Assistant Professor of Anatomy, Western Reserve University. The C. V. Mosby Company, St. Louis. 1949. Price, \$5.50.

Presenting in the smallest possible compass the essential facts of human anatomy. Stress is laid on the function of each part and on the integration of each tissue and organ of the body. More than 300 illustrations by an accomplished artist add much to the text which is very commendable.

\* \*

**Current Therapy: 1949**

Howard F. Conn, M.D., Editor, and a staff of twelve consulting editors, all men of well known ability in the field of therapy. W. B. Saunders Company, Philadelphia. Price, \$10.

Presenting the latest methods of treatment, endorsed and in use. To ensure the best possible, the Board of Consultants selected authorities, nearly 300 in number, to write the articles on the specific treatment of given diseases. The text is limited to treatment. The book is large and somewhat unwieldy, but the type is large and legible and the double column makes it easier to read the printed word. The authors are to be congratulated on their fine achievement. The practitioner will find this work most useful in every day practice.

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**How to Live Longer**

By Justus J. Schiffers, with a foreword by Ralph F. Sikes, M.D. E. F. Dutton Company, Inc., New York. 1949. Price, \$3.

Stresses health education of the public and presents numerous statistics to prove that it is possible to live longer by observing not too many rules which the average individual delights to break and, hence, shortens his life. Both the profession and the layman will enjoy this book and derive profit from it.

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**Child Health Services and Pediatric Education**

Report of the Committee for the Study of Child Health Services of the American Academy of Pediatrics with the cooperation of the U. S. Public Health Service and the U. S. Children's Bureau. The Commonwealth Fund, New York. 1949. Price, \$3.50.

A fine study well illustrated and clarified by many charts and diagrams and made by experts.

**Diseases of the Liver, Gallbladder and Bile Ducts**

By S. S. Lichtman, M.D., Assistant Professor of Clinical Medicine, Cornell University Medical College. Ed. 2. Lea & Febiger, Philadelphia. 1949. Price, \$18.

Revised and brought up to date, demanding a 20 per cent increase in the size of the book, now 1135 pages and 147 illustrations.

Changes and additions include an entirely rewritten chapter on infectious hepatitis; the most current advances in the diagnosis and treatment of biliary tract disease; a revised section on liver function tests with special attention given to flocculation tests; and rewritten discussions of the metabolic functions of the liver, with advances based on studies employing isotope and radioactive tracers. The use of specific metabolic agents as protective substances against liver poisons and for replacement therapy is presented in the fullest detail. The revised chapter on symptomatology contains a scientific analysis of hepatic insufficiency, thus establishing the ready clinical recognition of liver failure. Extensive new consideration is given to cirrhosis, with emphasis on laboratory diagnosis and medical and surgical treatment.

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**Microbiology and Man**

By Jorgen Birkeland, Ph.D., Professor of Bacteriology, Ohio State University. Ed. 2. The Williams & Wilkins Company, Baltimore. 1949. Price, \$5.

An account of the diverse properties and characteristics of microorganisms, a description of the various tools and techniques for their handling and an inquiry into their subtle relationships to everyday life. Revised; much new material including six new chapters and illustrations.

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**A Primer of Electrocardiography**

By George E. Burch, M.D., Henderson Professor of Medicine, Tulane University School of Medicine, and Travis Winsor, M.D., Assistant Clinical Professor of Medicine, University of Southern California Medical School. Ed. 2. Lea & Febiger, Philadelphia. 1949. Price, \$4.50.

Presenting the fundamentals of electrocardiography as a basis for further study of this important means of diagnosis. Many new features and new illustrations are included. An excellent book for the student and the beginner in this field.

### Diagnosis of Viral and Rickettsial Infections

Edited by Frank L. Horsfall, Jr., Rockefeller Institute for Medical Research. Columbia University Press, New York. 1949. Price, \$3.75.

Report on symposium held at the New York Academy of Medicine January 29 and 30, 1948.

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### Aesculapius Comes to the Colonies

By Maurice Baer Gordon, M.D. Ventnor Publishers, Inc., Ventnor, N. J. 1949. Price, \$10.

A comprehensive survey of the history of medicine in the thirteen original colonies. The author used quotations from original accounts, reproductions of colonial documents, newspaper items and even advertisements. A most interesting book which will be appreciated by any reader, especially he who is interested in medical history.

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### Joseph Bolivar DeLee: Crusading Obstetrician

By Morris Fishbein, M.D., with Sol Theron DeLee, M.D. E. P. Dutton & Co., Inc., New York. 1949. Price, \$5.

The interesting story of a man who had an ideal which he succeeded, by hard work and unfailing enthusiasm, in translating into an actuality of mammoth proportions. A considerable part of the reduction in maternal and infant mortality is due entirely to his work. The book is a most interesting one and should be read by every medical student in order to give him the correct perspective of the advances that have been made in the care of prospective mothers and newborn infants through the work of one man.

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### Thank God for My Heart Attack

By Charles Yale Harrison. Henry Holt and Company, New York. 1949. Price, \$2.50.

The story of a man who suffered an attack of coronary thrombosis—and what he learned from it. He gives much practical advice which should be helpful to others who have suffered as did the author.

♦ ♦

### Guiding Human Misfits

By Alexandra Adler, M.D., Assistant Professor of Neurology, New York University College of Medicine. Philosophical Library, New York. 1949. Price, \$2.75.

A practical application of individual psychology to persons at odds with reality and in need of sympathy, understanding and guidance.

### Atlas of Oral and Facial Lesions and Color Film Library

By Ralph Howard Brodsky, D.M.D., Lecturer in Stomatology, Graduate School of Medicine, New York University. The Williams & Wilkins Company, Baltimore. 1949. Price (with 100 slides), \$80.

This new and entirely unique teaching unit consists of a cloth bound text of approximately 130 pages, and a slide case of plastic, bound to match the book and designed to stand on a bookshelf. The case is light and easy to keep clean. The 100 color slides are encased in dustproof glass and fit into numbered slots, so that any one slide is easily found and removed for examination. Numbers correspond to those in the text.

Clinical pictures on film slides in natural color are correlated with a textbook, for the purpose of teaching the relation of oral disease to systemic disease. One hundred slides depict the lesions of the face and oral cavity, in color and with the three dimensional quality which is so rarely found in the printed illustration, no matter how fine the detail or how excellent the reproduction. The text discusses the important features of the lesion, explains the diagnosis, and recommends treatment. Each slide is represented in the text by a diagrammatic drawing of the slide under discussion, with arrows pointing out the salient features.

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### Evaluation of Chemotherapeutic Agents

Edited by Colin M. MacLeod. A symposium held at the New York Academy of Medicine, March 25-26, 1949. Columbia University Press, New York. 1949. Price, \$4.

A general evaluation of certain of the many factors involved in the success or failure of chemotherapy. Cancer chemotherapy is included.

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### Clinical Auscultation of the Heart

By Samuel A. Levine, M.D., Professor of Medicine, and W. Proctor Harvey, M.D., Research Fellow in Medicine, Harvard Medical School. W. B. Saunders Company, Philadelphia. 1949. Price, \$6.50.

Stressing the value and importance of auscultation in the diagnosis of heart lesions. Well written and well illustrated. A useful book for student as well as practitioner. Every clinical clerk should have a copy.

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### Neurological Anatomy in Relation to Clinical Medicine

By A. Brodal, Professor of Anatomy, University of Oslo, Norway. Oxford University Press, New York. 1948. Price, \$14.75.

### **Pain Syndromes: Treatment by Paravertebral Nerve Block**

By Bernard Judovich, M.D., Instructor in Neurology, and William Bates, M.D., Professor of Surgery, Graduate School of Medicine, University of Pennsylvania. Foreword by Joseph C. Yaskin, M.D., Professor of Neurology, Graduate School of Medicine, University of Pennsylvania. Ed. 3. F. A. Davis Company, Philadelphia. 1949. Price, \$6.

This work is based upon the fact that clinically, the combination of segmental pain and tenderness usually is due to factors which irritate roots, ganglia, or trunks of the spinal sensory nerves, and not due to painful impulses originating in diseased viscera. The authors emphasize that the various forms of therapy should be applied to the source of pain and not to areas of referred pain where treatment is of little value.

The clear text and illustrations show exactly how the interpretation of pain can be greatly facilitated by eliciting tender skin zones which accompany the pain and that the presence of tenderness and its distribution is of great aid in diagnosis and therapy. Just how to examine the patient, the methods of eliciting tenderness, the various forms of therapy employed and how and where to apply them are clearly described.

In this new third revised and enlarged edition the authors further clarify the management of pain problems. The section on brachial plexus pain has been enlarged by a summary of etiological factors and a new outline of diagnostic procedures including a differential method of examination. Pain in the neck, chest and shoulder girdle and upper extremity are clearly presented in newly written and enlarged chapters—Brachial Plexus Neuralgia and Scalene Antic Syndrome. Endometriosis as a cause of major backache is presented with case histories. The intravenous use of procaine as a method of pain control is presented with indications and technic of administration. Chapters on atypical facial pain and the technic for aborting attacks of migraine have been added.

### **Histology and Histopathology of the Eye and Its Adnexa**

By I. G. Sommers, M.D., Assistant Professor of Ophthalmology, College of Medical Evangelists. Grune & Stratton, New York. 1949.

Divided into three parts: (1) normal histology of the eye; (2) general pathology with emphasis on its application to pathology of the eye: bacteriology and parasitology included; (3) histopathology of the eye. Appended to each section is a resume of source material consulted and a voluminous bibliography.

### **Handbook of Materia Medica, Toxicology and Pharmacology**

By Forrest R. Davison, Ph.D., M.B., Consultant and Toxicologist, Minneapolis, Minnesota. Ed. 4. The C. V. Mosby Company, St. Louis. 1949. Price, \$8.50.

All about the practical use of drugs to ensure intelligent drug therapy. Considerable space is given over to prescription which is not amiss inasmuch as medical students too often do not receive sufficient training in how to write an intelligent prescription which leads to far too much reliance on single drug therapy as supplied by the numerous pharmaceuticals advertised widely by drug manufacturers. On the whole, an excellent book for the medical student.

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### **Operative Surgery**

By Frederick C. Hill, M.D., Associate Professor of Surgery. The Creighton University School of Medicine. Oxford University Press, New York. 1949. Price, \$12.75.

A small single volume (easily handled) work on general surgery in which the gross appearance of surgical lesions is described, the proper treatment is indicated and detailed description of operative procedures is given. It is purely an operative surgery. The text is good; the illustrations are excellent and most descriptive; chapter headings are new and unique, a resume of the contents of the chapter. Students will like this book.

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### **Nursing of the Sick: 1893**

By Isabel A. Hampton and others. McGraw-Hill Book Company, Inc., New York. 1949. Price, \$3.50.

Papers and discussions from the International Congress of Charities, Corrections and Philanthropy, Chicago, 1893, published in 1949 under the sponsorship of the National League of Nursing Education.

\* \*

### **Schafer's Essentials of Histology**

Edited by H. M. Carleton, University Lecturer on Histology, and E. H. Leach, University Demonstrator in Physiology, Lincoln College, Oxford. Ed. 15. Lea & Febiger, Philadelphia. 1949. Price, \$6.50.

This well known text on histology has survived 14 editions, which must be accepted as a measure of its worth. It has been the text for many practitioners, especially the oldsters, and has always fulfilled its function. The text is concise; easily read and complete as to content. The more than 600 illustrations, many in colors, add much to a fuller understanding of histology.

**Cardiac Catheterization in Congenital Heart Disease: A Clinical and Physiological Study in Infants and Children**

By Andre Cournand, M.D., Associate Professor of Medicine, Columbia University College of Physicians and Surgeons; Janet A. Baldwin, M.D., Assistant Professor of Pediatrics, New York University College of Medicine, and Aaron Himmelstein, M.D., Instructor Department of Surgery, Columbia University College of Physicians and Surgeons. The Commonwealth Fund, New York. 1949. Price, \$4.

A description of the technic employed in this procedure.

\* \*

**Office Management for Health Workers**

By Frances King and Louis L. Feldman. The Commonwealth Fund, New York. 1949. Price, \$2.25.

Adapts the principles of standard office practice to the special needs of the health department or the voluntary agency. Covers all phases of organizing a new health office or making an established one more efficient and effective. Every aspect of the subject matter is covered thoroughly.

\* \*

**Medicine Throughout Antiquity**

By Benjamin Lee Gordon, M.D., Foreword by Dr. Max Neuburger. F. A. Davis Company, Philadelphia. 1949. Price, \$6.

This book traces the history of medicine from the dim days of prehistoric antiquity to the end of the Greco-Roman period in 476 A.D. Some of the coverage deals with: primitive concepts of disease and death; nature worship and medicine; medicine of ancient Egypt and Assyro-Babylonia; ancient Hebrew medicine; Persian, Indian, Chinese; Japanese; medicine among the prehistoric Amerinds; influence of philosophy on medicine; Hippocrates; the Athenians, Peripatetics, Epicureans and Stoics; the Alexandrian school; empiricism; the methodic school; encyclopedists; pneumatics and eclectics; Galen Talmudic medicine. The book leaves off where most other histories of medicine begin. Most interesting and informative.

\* \*

**Encyclopedia of Criminology**

Edited by Vernon C. Branham, M.D., and Samuel B. Kutash, Ph.D., respectively, Chief, Outpatient Section, Neuropsychiatric Division, Veterans' Administration, and Chief Clinical Psychologist, Newark Mental Hygiene Clinic, Veterans' Administration. Philosophical Library, New York. 1949. Price, \$12.

Covering the problems of crime and criminology; presenting a compendium of existing facts and knowledge in criminology.

**Fundamentals of Internal Medicine**

By Wallace M. Yater, M.D., Director Yater Clinic, Washington, D. C. Ed. 3. Appleton-Century Crofts, Inc., New York. 1949. Price, \$12.

The author and contributors have produced a monumental work—both as to text and size—which covers the entire field of internal medicine. The book is also well illustrated. Especially worthy of mention are the chapters on dietetics, chemotherapy and therapy with antibiotics, clinical values and useful tables and finally, but not least, the chapter on the physician himself in which are discussed by the senior author (1) emblems of medicine; (2) the art of being a medical student; (3) internship; (4) residency or fellowship; (5) license to practice; (6) specialist certification; (7) medical societies; (8) graduate medical education; (9) medical journals; (10) principles of medical ethics; (11) practice and (12) the future of medical practice.

\* \*

**Geriatric Medicine:**

**The Care of the Aging and the Aged**

Edited by Edward J. Stieglitz, M.D. (an internist with many professional connections and holder of lectureships). Ed. 2. W. B. Saunders Company, Philadelphia. 1949.

Forty-seven collaborators of known professional skill have aided the editor in producing a complete exposition of the health problems of the aged. Geriatric medicine cuts across the field of the various specialties of modern medical practice that the knowledge and experience of many authorities is needed to present the picture in its complete and proper form to the practitioner. The text is covered by being arranged according to systems of the body. Tables, graphs and illustrations elucidate the text. For the care and treatment of those who are chronically ill, which more often than not means the aged, this work will be found to be a real asset.

\* \*

**Fundamental Considerations in Anesthesia**

By Charles L. Burstein, M.D., Instructor in Anesthesia, New York University College of Medicine. The Macmillan Company, New York. 1949. Price, \$4.

Based on the author's experience and research. Provides answers to many perplexing questions concerning complications that may arise during surgical intervention.

\* \*

**Topographical Anatomy of the Dog**

By O. Charnock Bradley, M.D. Revised by Tom Grahame, T.D., Professor of Anatomy, Royal (Dick) Veterinary College, Edinburgh. Ed. 5. Oliver & Boyd, Edinburgh. 1948. Price, \$7.



**Textbook of Histology**

By Jose F. Nonidez, D.Sc., Professor of Microscopic Anatomy, University of Georgia (deceased), and William F. Windle, Ph.D., Sc.D., Professor of Anatomy, University of Pennsylvania. McGraw-Hill Book Company, New York. 1949. Price, \$6.75.

Presents in concise form the fundamental facts of the finer structure of the mammalian body, including man, and emphasizes the functional aspects. A new approach to the teaching of histology.

\* \*

**How to Become a Doctor**

By George R. Moon, Examiner and Recorder, University of Illinois College of Medicine, Dentistry and Pharmacy. The Blakiston Company, Philadelphia. 1949. Price, \$2.

An aid to would-be doctors in planning their training, evaluating or improving their chances for entry into a professional school and the probabilities for success after graduation. It goes into detailed discussion and analysis of the problems of finances, housing, outside employment, internships and residencies. Also covers many fields ancillary to medicine.

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**The First Medical College in Vermont: Castleton, 1818-1862**

By Frederick Clayton Taite, Dover, N. H. Vermont Historical Society, Montpelier. 1949.

The author's interest in medical colleges in small towns is largely responsible for this book. For medical historians it will have much interest. Much credit is reflected on the early medical practitioners who gave freely of their time to prepare others for medical practice. And, this record adds another feather in the cap of the State of Vermont as a leader in many fields, including medical education. The present medical college can be proud of its early history.

\* \*

**America's Health:****A Report to the Nation**

By the National Health Assembly. Harper & Brothers, New York. 1949. Price, \$4.50.

The official report of the National Health Assembly convened at the behest of the President to consider the whole question of public health policy for the next decade.

\* \*

**The New York Academy of Medicine: Its First Hundred Years**

By Philip Van Ingen. Columbia University Press. 1949. Price, \$10.

A compilation and analysis of 100 years of activity.

**Operative Technic in General Surgery**

Edited by Warren H. Cole, M.D., Professor and Head of the Department of Surgery, University of Illinois College of Medicine. Introduction by Frank H. Lahey, M.D. Appleton-Century-Crofts, Inc., New York. 1949.

With the assistance of 34 collaborators, each an authority in his field, the author has provided an authoritative description of surgical technic, wound healing and care of wounds, hemorrhage and shock, burns, pre-operative and postoperative care. The authors stress that it is impossible for the surgeon to attain great technical skill in any given operative procedure except by special interest in the procedure and by performing it over and over again. Operators of every degree will welcome this book. More than 500 fine illustrations add much of value to the text.

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**Experimental Surgery: Including Surgical Physiology**

By J. Markowitz, M.B., Ph.D., M.S. In Exp. Surg. (Minn.). Ed. 2. The Williams & Wilkins Company, Baltimore. 1949. Price \$7.

The author regards experimental surgery as a branch of physiology, hence speaks of it from that point of view. The style is discursive and readable. The antivenesection movement is discussed briefly but effectively. Care and feeding of animals, technic for operating on dogs, elementary exercises suitable for medical students are some of the extra-surgical subjects discussed. The book is well illustrated.

\* \*

**Medical Photography: Radiographic and Clinical**

By T. A. Longmore. With a Foreword by Brigadier D. B. McGrigor. Ed. 4. The Focal Press, London. 1949. Price, \$15.

This book is a "must" for the men who work in this field. Its 1,000 pages contain much valuable information on every angle of photography. The photographic process, preparation of sensitive materials, general photographic sensitometry, photographic considerations in radiography, X-ray materials, screens and cassettes, chemistry of development, photographic solutions, photo technic and color photography are some of the topics discussed. The fine text and the numerous illustrations add to the value of descriptions.

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**Living Anatomy**

By R. D. Lockhart, Regius Professor of Anatomy, University of Aberdeen, Scotland. 1948. Price, \$4.

An anatomical study containing 149 photographs of the living subject, male and female, displaying muscles in action.



**Care of the Surgical Patient**

By Jacob Fine, M.D., Professor of Surgery at Beth Israel Hospital, Harvard Medical School. W. B. Saunders Company, Philadelphia. 1949. Price, \$8.

Covers the entire field of surgical procedures, including pathologic physiology and principles of diagnosis and treatment; pre-operative and postoperative care; anesthesia; nutrition. Divided into (1) regional and special surgery; (2) endocrine diseases and hormone therapy; (3) coincidental and medical illnesses; (4) general preoperative and postoperative care. A different book from the usual surgical text.

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**Textbook of Medicine**

By Various Authors: Edited by Sir John Conybeare, M.C., D.M. (Oxon), F.R.C.P., Physician to Guy's Hospital, London. Ed. 9. The Williams & Wilkins Company, Baltimore. 1949.

A new format; the general character and scope of the book remains unchanged. Much of the text has been rewritten. New: A table of approximate equivalents of weights and liquid measures in the imperial and metric systems.

**Psychosomatic Medicine**

By Edward Weiss, M.D., Professor of Clinical Medicine, and O. Spurgeon English, M.D., Professor of Psychiatry, Temple University Medical School. Ed. 2. W. B. Saunders Company, Philadelphia. 1949. Price, \$9.50.

The psyche as a factor in producing illness is gaining ground as an important item for consideration in clinical medicine. This book gives complete coverage of the subject. A chapter on psychosomatic diagnosis includes advances in psychological testing that have been applied in psychosomatic diagnosis and prognosis. New charts and tables summarizing diagnostic points and treatment suggestions are included. The various systems of the body are discussed serially from the psychosomatic point of view.

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**Syphilis and Its Course and Management**

By Evan W. Thomas, M.D., Professor of Clinical Medicine, New York University College of Medicine. The Macmillan Company, New York. 1949. Price, \$5.50.

Discusses the various phases of the disease and outlines principles of treatment.

**Three Helpful Lea & Febiger Books****Hartman and Brownell--The Adrenal Gland**

By FRANK A. HARTMAN, Ph.D.  
Professor of Physiology, Ohio State University, Columbus, Ohio  
and KATHARINE A. BROWNELL, Ph.D.  
Instructor in Physiology, Ohio State University  
New Book. 581 Pages. 72 Illustrations. \$12.00

**Lichtman--Diseases of the Liver,  
Gallbladder and Bile Ducts**

By S. S. LICHTMAN, M.D., F.A.C.P.  
Assistant Professor of Clinical Medicine, Cornell University Medical College  
New (2nd) Edition. 1135 Pages. 147 Illustrations and 4 in Color on 2 Plates.  
\$18.00

**Burch & Winsor--Primer of  
Electrocardiography**

By GEORGE E. BURCH, M.D., F.A.C.P.  
Henderson Professor of Medicine, Tulane University School of Medicine  
and TRAVIS WINSOR, M.D., F.A.C.P.  
Assistant Clinical Professor of Medicine, University of Southern California  
Medical School  
New (2nd) Edition. 245 Pages. 265 Illustrations. \$4.50

Washington Square **LEA & FEBIGER** Philadelphia 6, Pa.

